

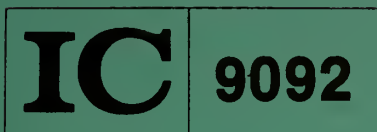
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Application of Employee Turnover Research Findings to the Underground Mining Industry

By Robert H. Peters



UNITED STATES DEPARTMENT OF THE INTERIOR

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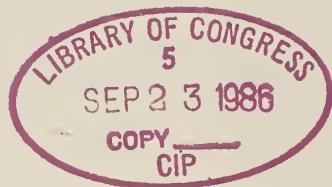
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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

°F
h

degree Fahrenheit
hour

pct
yr

percent
year

APPLICATION OF EMPLOYEE TURNOVER RESEARCH FINDINGS TO THE MINING INDUSTRY

By Robert H. Peters¹

ABSTRACT

Several significant problems associated with employee turnover among underground miners are described in this Bureau of Mines report. Although a vast amount of research has been conducted on turnover among employees in nonmining industries, there has never been an attempt to empirically investigate the causes of turnover among underground miners. This report presents the results of empirical research on employee turnover in other industries and describes and critiques the research methods that have been used to investigate turnover. Using the findings on employee turnover in other industries and known data about miners and the mining industry, a conceptual model of the factors that cause turnover among miners was generated. This model, which is expected to provide a basis for later empirical studies, is presented. Several recommendations for controlling miner turnover are also presented.

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INTRODUCTION

Various researchers have noted that high turnover results in accidents and injuries (1-2).² The inexperience of newly hired workers and their unfamiliarity with the work environment are usually cited as the major reasons for the losses that accompany high turnover. In addition to accidents, the consequences of high turnover also include lower productivity, spoilage (supply waste), lower morale, and higher costs of training and personnel administration (3).

Johansen (4) argues that high labor turnover is a major reason for the fact that accidents in underground coal mines throughout the Western United States are unusually high in number and severity. Given the unusually hazardous nature of underground work, it is particularly important to minimize employee turnover at underground mines. High turnover results in a work force that is, on the whole, less experienced; and the less experience miners have, the greater is the chance they will cause accidents and injuries.

High turnover also causes unusually difficult production problems for underground coal mines. There are several reasons why turnover is a greater threat to productivity in underground coal mining than in other industries. Goodman (5) notes that the technology and environment of underground coal mining make it especially difficult to predict what will happen in the course of day-to-day work. The inherent physical conditions create this uncertainty and represent a major factor in the production process. The layout and darkness make it difficult for supervisors to review the work of their subordinates. The technology of mining requires a high degree of interdependence within and among crews. If one machine fails, often the whole production process must be shut down. Since the mining cycle extends over the shift cycle, there must be good coordina-

tion between shifts. Shifts or crews are evaluated in terms of their productivity, so there is a tendency to focus on increasing a crew's productivity. This may lead to intercrew conflict and lower production. There is also a high interdependence between the inside section and the outside. Failure to bring in the right supplies can lead to long downtimes because travel in and out of a section can take an hour or more. Without adequate planning, there can be a lot of downtime and production can be lost.

In summary, the environment and technology of mining necessitate a high degree of coordination between miners and highly predictable miner behavior. High turnover can seriously hamper production because the newly hired miner is likely to be unfamiliar with the environment, the behavior of coworkers, and possibly the equipment and procedures that are used. New miners are more apt to inadvertently do things that cause production delays, accidents, and various other types of losses.

The Bureau of Mines conducted this study of the causes for miners' turnover because (1) the potential for reducing accidents and labor costs through the reduction of turnover appears to be great, and (2) there have been no systematic attempts to study the causes of miner turnover.

Since there have been no systematic attempts to study the cause of miner turnover, the first phase of this study was to review and summarize what is already known about employee turnover based on empirical research in nonmining industries. The second phase was to generate a model of the factors that produce turnover among underground miners. Therefore, this report presents (1) a summary and critique of the empirical research on employee turnover, (2) a model of the turnover process for underground miners, and (3) recommendations for controlling miner turnover.

REVIEW OF EMPLOYEE TURNOVER LITERATURE

Studies of employee turnover from work organizations abound in the literature on organizational behavior and industrial psychology. Beginning with the early studies of Bernays (6) and Crabb (7), and continuing to the present, well over 1,200 separate studies on the subject can be identified. Moreover, over the last 25 yr, at least 13 review articles on turnover have appeared (8-20). Clearly, the subject has not been neglected by researchers.

Economic Costs

Continued attempts to better explain and control turnover are understandable due to the financial costs associated with turnover. Estimates of the costs of recruiting and assimilating new employees into the work situation made before the economic inflationary spiral of the late 1970's suggested that such expenses ranged from \$1,000 for clerks (21) to \$300,000 for jet fighter pilots (22). A set of reports which focused only on the replacement cost directly associated with hiring new employees (and not with training) found that this expense was \$1,018 for a registered

nurse (23), \$800 for a first-line supervisor (24), and ranged from \$145 for clerks to \$990 for college graduates in the public sector (25). More recently, Seybolt (26) has estimated that the cost of replacing even the lowest level employee in an organization will usually exceed \$3,000.

The significance of these costs becomes greater in light of a 1979 job tenure report that about 30 pct of the 91 million Americans employed in January 1978 were on jobs they had found during the prior year (27). While this figure was partially influenced by such factors as a high level of unemployment and the large flow of youth and women into the work force, the fact remains that making a job change is not particularly unusual for the American worker. In the manufacturing industry alone, the turnover rate was estimated to be about 50 pct in 1975, a percentage that had remained fairly constant over the prior decade (28). Thus, with a substantial level of mobility, the significance of the total replacement costs for employees becomes substantial. The financial considerations alone underscore the importance of understanding determinants of turnover. While attempts to predict and understand this type of employee withdrawal have been made and reported for at least the last 70 yr, the problem continues to persist in large enough magnitude to not only justify, but to require, further research efforts.

²Italic numbers in parentheses refer to items in the list of references preceding the appendix.

Varieties of Turnover

Price (17, p. 3) defines turnover as the degree of individual movement across the membership of a social system. Labor economists, such as Parnes (29), distinguish seven types of "movement":

1. Interfirm movement, from one firm to another or a change of employer.
2. Occupational movement, from one occupation to another.
3. Industrial movement, from one industry to another.
4. Geographic movement, from one local area to another.
5. Movement from an unemployed to an employed status.
6. Movement from an employed to an unemployed status.
7. Movement into and out of the labor force.

Turnover corresponds to Parnes' "interfirm movement" and thus is one type of labor mobility.

Voluntary and involuntary turnover are commonly distinguished. Voluntary turnover is individual movement across the membership boundary of a social system that is initiated by the individual (30). The term "quits" is probably the most frequent label for voluntary turnover. "Quits" and "resignations" are generally used interchangeably. Involuntary turnover is movement not initiated by the individual; examples are dismissals, layoffs, retirements, and deaths.

Most involuntary turnover is probably initiated by the organization. Dismissals, layoffs, and retirements are examples of organizationally initiated turnover. It is possible, however, for turnover to be initiated by neither the member nor the organization. An example might be a wife who leaves her job at her husband's insistence. Involuntary turnover is best viewed as a residual concept that refers to all movement not initiated by the member. Although there are difficult methodological problems involved in distinguishing voluntary and involuntary turnover, the distinction continues to be important in the literature.

Voluntary turnover is more often studied than involuntary turnover. There are at least three reasons for the concentration on voluntary turnover. First, most turnover is voluntary. The major exception is the high rate of involuntary turnover when unemployment is high (31, pp. 65-72). Second, the formation of theory is easier when the phenomenon to be explained is homogeneous. The division of turnover into two types results in the formation of one fairly homogenous type—voluntary turnover. It would be very difficult to explain both quits and dismissals by the same theory, because the two phenomena probably have quite different determinants. By assigning dismissals to involuntary turnover, the homogeneity of voluntary turnover is considerably increased, and the task of forming theory is made somewhat easier. Third, voluntary turnover is more subject to control by managers. Retirements and deaths are less easily controlled than quits. And it is natural for managers to focus their attention on phenomena they can control to some degree.

When turnover is discussed in the literature, the usual reference is to voluntary separation. Substantive findings, such as those pertaining to the determinants of turnover, usually refer to voluntary separations. This review reflects the literature's emphasis on voluntary separations. Unless

otherwise indicated, "turnover" refers to individuals who voluntarily leave organizations.

As previously indicated, several detailed reviews of the employee turnover literature have recently been published. Much of this section is devoted to discussing the most recent comprehensive review, by Mobley (32). However, conclusions from three other recent reviews of this literature are occasionally interjected (16-17, 33). After the discussion of Mobley's review, significant findings from 14 studies on turnover published since the Mobley review are presented. A brief description of each of these 14 studies is given in the appendix. The section concludes by comparing the most recent findings (those published since 1981) with Mobley's observations.

THE MOBLEY REVIEW

Mobley groups the many variables that have been used to empirically account for turnover into four major categories: economic indexes, variables that characterize jobs and organizations, variables that characterize people, and integrative variables. Integrative variables are those which represent the combined influence of more than one of the three preceding types of variables.

The External Economy

There is abundant evidence that the state of the economy (as indexed by the availability of jobs) affects turnover rates. As unemployment goes up, the quit rate goes down. It is important to recognize that this relationship is based on highly aggregated data. Mobley notes that overall unemployment as a predictor fails to account for occupational differences in labor market demand. This means that an organization should not rely too heavily on national unemployment rates for turnover prediction, but should assess the relationship between employment and unemployment in its specific labor markets and turnover among its employees. Mobley contends that effective understanding and management of turnover requires analysis of individual-level variables and cautions that aggregate analyses of economic and labor market correlates³ of turnover rates do not address the question of which *individuals* will leave. To predict turnover at the individual level of analysis, it is necessary to assess how individuals perceive the availability of jobs.

Organizational Variables

This section summarizes the sizable literature on relationships between organizational variables and turnover. The focus is on categorical and descriptive characteristics of organizations. Satisfaction with various organizational variables and other attitudinal variables are discussed in the section on individual variables.

Occupational Categories

Mobley notes that the Price review (17) suggests that turnover is higher among (1) blue-collar workers than

³As used in this report, "correlates" refers to factors (e.g., age) that have been found to be statistically associated with whether or not employees have remained with their employer during some period of time. Although correlates provide a basis for drawing conclusions about how likely it is that employees will leave, they do not necessarily help explain why certain employees (e.g., younger ones) are more likely to leave than others.

among white-collar workers, (2) lower skill levels within the blue-collar category, and (3) nonmanagerial categories. However, Price cautions that these generalizations are based on only a very small number of studies and may not hold true in all segments of the population.

Organizational Size

Empirically, the research on turnover and organizational size supports no clear-cut conclusion. Conceptually, one might expect increasing size to be associated with lower turnover, since larger organizations might have more internal mobility opportunities, sophisticated personnel selection and human resource management processes, more competitive compensation systems, and personnel research activities devoted to turnover. Conversely, larger organizations might be expected to experience higher turnover due to communication problems, lower group cohesion, and greater impersonalization and bureaucratization.

Work-Unit Size

Mobley notes that work-unit size is possibly related to turnover through other variables such as group cohesion, personalization and communication. There is some evidence that smaller work units have lower turnover, particularly at the blue-collar level. However, because there have been relatively few studies analyzing unit size, either singularly or in combination with other possible explanatory variables, a strong generalization is not possible.

Pay

Researchers have established that there is a strong relationship between pay levels and turnover rates. The relative level of earnings is one of the most important factors accounting for inter-industry variations in voluntary separation rates. However, Mobley cautions that the aggregate correlation between pay levels and turnover rates does not in itself indicate which *individuals* will leave. To understand turnover at the individual level of analysis, one must consider issues of equity in pay administration, individual differences with respect to the importance of pay, and the effects of performance-contingent or noncontingent pay systems. Mobley also notes that researchers have an insufficient understanding of the substitutability of benefits or other rewards for pay or interaction of pay with other organizational factors such as supervisory style and job content; nonjob factors such as compatibility with nonwork roles; and individual factors such as willingness to defer immediate gratification or rewards, commitment, etc.

Job Content

There appear to be relationships between turnover and certain job characteristics at aggregated levels of analysis. Price (17) indicates that there is a weak but consistent positive relationship between routinization and turnover. Porter (16) found support for a positive relationship between task repetitiveness and turnover and a negative relationship linking autonomy and responsibility to turnover. Mobley cautions that workers' responses to job content are a function of individual differences. This means it is more important to look at job content variables from an individual level of analysis.

Supervisory Style

Ley (34) found a strong correlation between foreperson authoritarianism and turnover among production workers. Saleh (35) found that the lack of supervisory consideration is the second most frequently cited reason for termination among nurses. Fleishman (36) observed that turnover was highest in work groups whose foreperson was inconsiderate. Mobley concludes that there is some support for a relationship between supervisory style and turnover.

Other Organizational Variables

Price (17) suggests that centralization (the degree to which power is centralized in a social system) produces higher levels of turnover and that integration (the extent of participation in primary relationships) and communication (the degree to which information is transmitted among members of a social system) produce lower levels of voluntary turnover.

Individual Variables

This section summarizes the voluminous literature on the relationships between individual variables and turnover. These individual-level correlates of turnover include demographic and personal factors, work and nonwork values, and perceptions and evaluations of the organization.

Age

Reviewers of the turnover literature report a consistent negative relationship between age and tenure—younger employees have higher probability of leaving. Mobley suggests several explanations for this relationship. Younger employees may have more entry-level job opportunities and few family responsibilities, thus making job mobility easier. They may also have inaccurate expectations regarding work that are not fulfilled in their early jobs.

Length of Service

As with age, reviewers of the turnover literature report a consistent negative relationship between length of service and turnover. Turnover is significantly higher for employees with shorter tenures. Mobley cites the interaction with age, inadequate match between job and individual, and inadequate early socialization as among the probable reasons for this relationship.

Sex

No simple relationship exists between sex of the employee and turnover. Mobley suggests that sex probably interacts with other variables as do occupation and family responsibility.

Education

Neither a strong nor a consistent relationship between education and turnover is evident. Mobley notes that since many turnover studies are based on individuals with similar educations, a relationship between turnover and education is difficult to establish.

Biographical Information

Research indicates that the development of situation-specific turnover predictors, based on weighted biographical data, can be a useful empirical technique.

Personality Variables

Porter (16) claims that the literature on turnover and personality variables suggests that people who leave the organization tend to be at the extreme end of such personality factors as achievement, aggression, independence, and self-confidence. However, Mobley and Muchinsky (33) believe that personality differences have a marginal impact on turnover.

Job Aptitude and Ability

Both the Porter (16) and Muchinsky (33) reviews conclude that the more similar job requirements and vocational interests are, the lower the turnover rate is. However, these conclusions are based on a very limited amount of research. There is evidence in the literature that aptitude and ability measures are related to turnover. Although the nature and magnitude of the reported relationships vary, Mobley recommends that organizations do try to use job-relevant aptitude and ability measures as predictors of turnover.

Source of Referral

Although there is not much research on the issue, available evidence suggests that the applicant's source of referral is an important predictor of turnover. Applicants referred by informal sources such as employees or relatives may have lower turnover than applicants referred by more formal sources such as employment agencies and advertising. Mobley suggests it is possible that applicants from informal sources have more accurate information and expectations about the job.

Performance Level

Mobley reports that only a few studies have examined the relationship between performance level and turnover and concludes that the findings on this issue are mixed.

Satisfaction With Pay

The literature reveals a generally consistent negative relationship between turnover and pay satisfaction. However, Mobley found a few exceptions, and advises against taking this relationship as a given in every situation.

Satisfaction With Promotion

Porter (16) found that the lack of promotional opportunities is a primary stated reason for withdrawal. However, both Price and Mobley found some exceptions to this relationship, and note that, without knowing an individual's career aspirations and opportunities for promotion, the predictive power of satisfaction with promotion may be diminished.

Satisfaction With Job Content

Mobley concludes that satisfaction with job content is among the strongest satisfaction correlates of turnover in recent research.

Satisfaction With Coworkers

There is only moderate empirical evidence to support a relationship between coworker satisfaction and turnover. Mobley suggests that measures of coworker relationships and satisfaction may be too crude. Coworker relationships have multiple dimensions and reflect task requirements, individual differences, and instrumental and personal relations.

Satisfaction With Supervision

There is much evidence that satisfaction with supervision can be related to turnover, although there are a number of exceptions in the literature. Mobley observes that research needs to move beyond general leader-satisfaction ratings to deal with specific types of leader-subordinate interactions.

Satisfaction With Working Conditions

In a national survey, Mangione (37) found a significant relationship linking resource adequacy and satisfaction with comfort to turnover. Except for this study, there is no strong evidence that working conditions are among the most important contributors to turnover.

Career Aspirations and Expectations

To completely understand turnover, it is necessary to evaluate employees' expectations concerning their future jobs with the organization—that is, the individual's assessment of whether or not his or her present job will be instrumental in attaining career aspirations. Relatively little research has been devoted to analyzing turnover in terms of congruence between the organization and long-range individual career aspirations. Career aspirations are subject to change. Thus, this congruence cannot be considered to be a constant.

Expectancy of Finding an Alternative Job

While unemployment level is a good aggregate predictor, it is inadequate at the individual level. Individuals have a differential knowledge of alternatives. To understand the individual's perspective, it is important to know the individual employee's expectancy of finding an alternative job. Mobley reports that several studies have examined employee expectancy of finding an alternative job and found it to be significantly although not strongly related to turnover. Mobley lists several possible reasons why the relationship is not stronger.

Integrative Variables

A number of variables have been suggested in attempts to integrate individual differences and perceptions of various aspects of the organization and/or the external environment. Evidence concerning the relationship of three such variables (overall job satisfaction, organizational commitment, and intentions to stay or quit) to turnover is reviewed in this section.

Overall Job Satisfaction

The literature clearly shows a consistent negative relationship between job satisfaction and turnover. However,

the correlations are rarely stronger than -0.4. Thus, other variables are needed to predict individual-level turnover. At a minimum, perceived alternative jobs must also be considered.

Organizational Commitment

Organizational commitment has been defined as the relative strength of an individual's identification with and involvement in a particular organization. There is strong evidence that commitment is related to turnover. There is also evidence that commitment is a better predictor of turnover than satisfaction. Mobley concludes that, both conceptually and empirically, commitment is one of the important individual-level determinants of turnover.

Intentions To Quit or Stay

Measures of behavioral intention to quit appear to be among the best individual-level predictors of turnover. Mobley strongly recommends the periodic assessment of behavioral intentions to quit, and correlates of these intentions, as a forecasting and diagnostic approach.

Individual Nonwork Variables

Most turnover research dealing with nonwork variables has focused on what is generally labeled "family responsibilities." This is a complex factor measured in a variety of ways, including the number and ages of children, marital status, etc. Muchinsky (33) suggests there is a positive relationship between family responsibility and turnover but that this relationship is moderated by whether the employee is the primary or secondary wage earner. Mobley predicts that, as dual-career families become more prevalent, as nonwork values become more central, and as more young people attach less importance to a stable and secure career, prediction and understanding of turnover will require inclusion of nonwork variables.

Multivariate Analyses

Analyses of turnover using one variable at a time do not permit evaluation of the relationships among the many variables related to turnover, identification of the relative importance of these variables, or the more accurate prediction of turnover that is possible when several relevant variables are used. Unfortunately, most studies of turnover have examined only one variable other than turnover at a time. However, there are a few exceptions. Mobley draws several conclusions from these studies. First, while job satisfaction is an important contributor to turnover, it does not include the effects of other relevant demographic,⁴ attitudinal, or cognitive variables. Second, demographic variables are an inadequate basis for understanding turnover. Third, behavioral intentions to quit or stay appear to be potent variables, conceptually and empirically. However, the fact that intentions and turnover are far from perfectly correlated suggests the need for better measurement and a continued search for other variables and processes.

Mobley's conclusions regarding the causes and correlates of turnover are summarized in table 1 (reproduced from Mobley 32, pp. 112-113).

⁴Demographic factors consist of characteristics, whether personal (such as age or educational background), family-related (such as number of dependents), or social (such as socioeconomic or geographic background), that describe the individual independent of his or her job. They are differentiated from factors such as work attitudes, economic and market factors, organizational factors, etc.

Table 1.—An interpretative summary of research on causes and correlates of turnover

Variables, by category	Interpretive assessment
Labor market:	
Inflation	Inconclusive.
Level of unemployment	Consistent.
Organizational:	
Autonomy and responsibility	Moderate.
Centralization	Do.
Communication	Do.
Integrative	Do.
Organizational size	Inconclusive.
Pay levels	Consistent.
Routinization and task repetitiveness	Moderate.
Supervisory style	Do.
Type of industry	Inconclusive.
Work-unit size	Moderate.
Individual:	
Absenteeism	Inconclusive.
Age	Consistent.
Aptitude and ability	Moderate.
Career expectations	Inconclusive.
Education	Do.
Family responsibility	Moderate.
Interests	Do.
Performance	Inconclusive.
Personality	Do.
Professionalism	Do.
Satisfaction with—	
Conditions of work	Moderate.
Coworkers	Do.
Job content	Consistent.
Pay	Moderate.
Promotion	Do.
Supervisor	Do.
Sex	Inconclusive.
Tenure	Consistent.
Integrative:	
Behavioral intentions to quit	Do.
Organizational commitment	Do.
Overall satisfaction	Consistent.
Stress	Inconclusive.

Source: Mobley (32).

COMPARISON OF RECENT TURNOVER RESEARCH WITH MOBLEY'S OBSERVATIONS

Table 2 summarizes the results of 14 empirical studies of turnover published after the Mobley review was conducted. The variables listed in this table have been grouped into the same four major categories as Mobley used in his table (table 1), i.e., labor market, organizational, individual, and integrative.

Labor Market Variables

Only one study from the more recent literature addressed the relationship of labor market variables to turnover. Terborg (38) found a significant negative relationship between the local unemployment rate and turnover among sales clerks. This finding is consistent with Mobley's summarization of earlier research on the unemployment-turnover relationship.

Organizational Variables

The Krackhardt study (39) supports Mobley's observation that supervisory style is related to turnover. Krackhardt found that increased communication between supervisors and subordinates was associated with reduced turnover among bank tellers. The negative relationship between job scope and turnover reported by Mowday (40) tends to support Mobley's conclusion that turnover tends to be positively associated with routinization and task repetitiveness. The two studies examining the effect of job previews on turnover report opposite results. Avner (41) claims that most research suggests that realistic job previews have a small positive (but not always significant) impact on turnover.

Table 2.—Summary of research on causes and correlates of turnover published since 1981

Variables, by category	Sample	Direction of association ¹	Reference
Labor market: Local unemployment rate	Sales clerks	—	38
Organizational:			
Job scope	County and State agencies	—	40
Level of job	Exxon Corp	—	43
Preview	Bank tellers	+	78
Realism of job	Gas station cashiers	—	41
Supervisor-subordinate communication	Bank tellers	—	39
Individual:			
Absenteeism	Manufacturing plant	+	46
Age	Nurses' aides	—i	45
Aptitude and ability	Sales clerks	—	38
	Exxon Corp	—	43
	Public utility	—i	44
	Sales clerks	+	38
Competitiveness	Manufacturing plant	+	46
Education and/or training	Sales clerks	+	38
	Nurses	—	80
Enthusiasm	Public utility	+	44
Extent of job market investigation	Professionals	+i	47
Health problems	Public utility	+i	44
Lack of children	Manufacturing plant	+	46
Need for achievement	County and State agencies	—	40
Need for autonomy	.. do.	—	40
Perceived job opportunity	Nurses	+	80
Performance level	Exxon Corp	—	43
	Manufacturing plant	—	46
	Bank tellers	—	81
Satisfaction with—			
Compensation	Aerospace production department	+	42
Compensation system equity	Public utility	—i	44
Coworkers	Aerospace production department	+	42
	Aerospace nonproduction department	—	42
	Public utility	—i	44
Job security	Aerospace company	—	42
Opportunity for family-social activities	Public utility	—i	44
Supervision	Aerospace company	—	42
	Public utility	—i	44
Work (job)	Professionals	—i	47
	Public utility	—i	44
Work space and equipment	Public utility	—i	44
Tenure	.. do.	—i	44
Worker trust	Aerospace company	—	42
Integrative:			
Commitment	.. do.	—	42
	Nursing and clerical	—	79
	Professionals	—i	47
Intent to leave	Manufacturing plant	+	46
	Nursing and clerical	+	79
	Nurses	+	80
Job stress	Manufacturing plant	+	46
	Nurses' aides	+i	45
	Public utility	+i	44

¹+ = positive association with dependent variable.

— = negative association with dependent variable.

i = employee's intent to leave organization (although study did not assess whether the employee actually remained or left during some subsequent period). The strength of the association of each variable listed with turnover or turnover intent was statistically significant at $p < 0.05$.

Individual Variables

Except for findings reported by Bardo (42) concerning satisfaction with compensation and coworkers, recent research generally supports Mobley's observations that turnover is negatively related to employees' satisfaction with various aspects of their jobs. In contrast to Mobley's conclusion that aptitude and ability are negatively related to turnover, Terborg (38) found that among sales clerks, ability was positively associated with their tendency to leave the organization. However, findings by Dreher (43) and Zedeck (44) tend to support Mobley. The discrepancy between the Terborg study and most other research on ability may be due to differences in the job levels of the employees studied. Perhaps predictions about employee turnover cannot be based solely on ability level, but need to be made contingent upon whether the employees under consideration hold low- or high-level positions.

There is a minor discrepancy between Mobley's observations and recent research examining the relationship of performance level to turnover. Mobley characterizes the evidence concerning this relationship as inconclusive. However, several recent studies report finding a significant negative relationship between these two variables (43, 46, 81). Jackofsky (48) argues that there is a relationship between performance and turnover, but that it is nonlinear. She believes the relationship is curvilinear. Jackofsky maintains that (1) very low performers are pushed out by the organization; (2) low but adequate performers (who are allowed to remain on the job) stay due to low ease of movement; and (3), as performance increases, turnover increases due to increases in the ease of movement.

Recent research concerning age, tenure, family responsibility, and perceived job opportunities tends to support Mobley's observations concerning the relationship of these variables to turnover (i.e., that age, tenure, and family

responsibility are all negatively related to turnover; and that perceived job opportunities is positively related to turnover).

Integrative Variables

Recent findings concerning the relationship of turnover to organizational commitment and intention to quit are con-

gruent with Mobley's observations. However, Mobley characterizes the evidence concerning the relationship of stress to turnover as inconclusive, whereas all three recent studies of this issue suggest that greater stress is associated with higher turnover (44-46).

METHODOLOGICAL AND INTERPRETIVE ISSUES IN TURNOVER RESEARCH

Several methodological problems are common to much of the research on turnover that has been conducted thus far. These methodological problems should be avoided in future research whenever possible. In addition, several mistakes are commonly made in interpreting the findings of turnover research. Both managers and researchers must be careful in interpreting the findings of turnover research in order to avoid making faulty conclusions about what causes turnover or how to prevent it. Both sets of issues are addressed below.

Definition and Measurement of Variables

Several authors note that turnover data taken from company records may not be entirely accurate. A variety of factors influence the administratively recorded reason for attrition. Lefkowitz (49) found significant differences between the administrative and self-reported reasons for terminations. Ilgen (50) and Latham (51) have commented on the likelihood of human error in recording absence as turnover. Since many studies have employed archival data in turnover research, it seems reasonable to conclude that turnover data is afflicted by an indeterminable amount of measurement error, such as mistaking absence for turnover. Mobley (13) suggests that, whenever possible, researchers should not rely on a single method for measuring turnover or the factors thought to influence turnover, but should use multiple measures.

There are many ways to operationally define turnover. These definitions and their limitations are presented in detail in a later section. Muchinsky (33) notes that many authors neglect to describe how they measured turnover. This makes it difficult to interpret their findings or compare them to the findings of other turnover studies.

As previously mentioned, most turnover researchers agree that it is important to distinguish between voluntary and involuntary turnover in attempting to predict turnover because the types of factors that produce these two types of separation are typically quite different.

Timeframe for Observation of Turnover

Some researchers try to predict the turnover that will occur within a few months after data on predictor variables have been collected; others have observed turnover for a few years and then attempted to assess its relationship to the predictor variables. Most researchers agree that the more time that goes by after data on predictor variables have been collected, the worse will be their ability to predict. Almost all factors that are used as predictors are dynamic—they change with the passage of time. For example, a model might predict that persons who are not happy with their

present jobs will be more likely to leave than those who are happy with their jobs. However, actual data might fail to confirm this prediction, because after the employees' job satisfaction was assessed, but while the data were still being collected, changes affecting satisfaction occurred (e.g., a new supervisor or company policy). The longer the period of data collection, the more likely such changes will occur, and the less likely it is that the data will produce valid conclusions. However, in order to have enough terminations to perform appropriate statistical tests of hypotheses, it is sometimes necessary to collect turnover data over long periods of time.

Subgroups Requiring Use of Different Models

Mobley suggests that it may be necessary to use different models to explain turnover among employees with different lengths of service. He states, "Different variables or combinations of variables exert a differential influence on turnover as a function of the employee's stage in the organization socialization process." Muchinsky (33) makes a similar argument regarding the employee's sex and race. Because the variables that best predict turnover among females may not be the same as those that best predict the turnover of male employees, turnover among these two sets of employees should not be analyzed using a single model. The researcher may need to develop separate models and separate the data according to sex before proceeding with analyses. Shott (52), and Kilbridge (53) were able to improve their predictive ability by performing separate analyses on the basis of sex. Similarly, improvements in predictive ability have also been obtained by performing separate analyses on the basis of racial differences (54-58).

Nonlinear Relationships

Mobley argues that certain variables may be related to turnover in a nonlinear fashion. For example, Jackofsky (48) presents convincing arguments for a nonlinear relationship between level of job performance and turnover. (This is discussed further in a later section.) Because there is a good chance that other such nonlinear relationships exist, researchers should not ignore the testing of interaction terms in their data analyses.

Nonwork Interests, Values, and Constraints

Steers (59) and Mobley (32), argue that nonwork variables are often ignored in turnover models. They believe that factors such as an employee's ties to activities and social groups in the community, or the constraints imposed by the career of an employee's spouse, can greatly influence

the likelihood that the employee will or will not remain with an employer, and that consideration of factors such as these would greatly increase the predictive power of turnover models.

Need for Research Involving Process Models

The turnover literature is largely characterized by studies that look at turnover and one other variable at a time. Such analyses do not permit evaluation of the relationships among the many variables related to turnover, identification of the relative importance of these variables, or the more accurate prediction of turnover that is possible when several relevant variables are used. More adequate prediction and understanding of turnover requires that process models be formulated and tested. Process models not only list the factors that cause employees to leave organizations, they also suggest the sequence of causation among variables, i.e., which variables influence the person first, which come in to play next, and the effect of feedback loops. (Feedback loops show how the reaction of some results of a process serve to alter or reinforce the character of that process.) Those who have attempted to formulate such models include March (12), Vroom (20), Price (17), and Mobley (32). Although the details of the models differ, turnover is generally thought to be a function of negative job attitudes combined with an ability to secure employment elsewhere.

Limitations of Aggregated Data

Many studies of turnover are based on aggregate or grouped data. Thus, the relationships found in these studies are between turnover *rates* and individuals *grouped* by the variables thought to be related to turnover. For example, a researcher could compare turnover rates by level of unemployment in the economy, by occupational group, by average job satisfaction within departments, etc. In human resource planning, analyzing such aggregate relationships may permit forecasting of turnover rates among the various grouping variables. For example, knowing that turnover is higher, on the average, among younger employees, or that it is highest in departments with the most job dissatisfaction, may be useful in projecting the number of quits in certain groups and the number of required replacements. However, it is important to note that such aggregate or grouped analysis does *not* permit prediction or understanding of which *individuals* will leave or stay. Such prediction requires individual-level rather than group-level analyses.

Experimental Designs

As a general comment on turnover research, cross-sectional correlational studies are the most abundant, but not the most desirable. Studies seeking correlates of turnover have employed concurrent [e.g., Schwab (60)], predictive [e.g., Farris (61)], and ex post facto [e.g., Wickert (62)] research designs. For the concurrent design, data on the predictor variables are collected sometime during (or at the end of) the period of time the turnover data are collected. For the predictive design, data on predictor variables are collected before the data on turnover are collected. For the ex post facto design, data are collected on the predictor variables after the data on turnover have been collected. The ex post facto design seems most open to criticism, as former employees can intentionally or unintentionally

distort their perceptions of work-related factors, thus increasing the likelihood of fallacious or spurious results. Concurrent designs frequently suffer from "data dredging," situations in which investigators may greatly rework concurrent predictor-criterion relationships in search of maximum predictability. Results generated from such designs frequently incur sizeable amounts of shrinkage upon cross-validation. In predictive designs, variables thought to be related to turnover are measured in advance and their relationship to subsequent turnover is assessed. Mobley (32) and Muchinsky (14) argue that predictive designs are the most stringent in terms of methodological rigor and probably have the most to offer in terms of practical value.

Extent to Which Job Meets Expectations

Research on realistic job previews clearly demonstrates how prior knowledge concerning the actual job environment can ultimately affect turnover (63). However, Steers (59) notes that "almost none of the existing 'comprehensive' models of employee turnover include the types of variables needed to adequately assess the extent to which one's expectations and values surrounding a job are met by one's organizational experiences." Therefore, future models should attempt to measure the extent to which employees' expectations are met.

Job Performance Level

Several researchers have recently argued that the role of job performance level as a factor influencing desire or intent to leave has been overlooked [e.g., Steers (59), Jackofski (48), and Marsh (64)]. They believe that high job performance may heighten an employee's expectations concerning organizational rewards, while poor performance may result in negative attitudes concerning the intrinsic worth of the job. Therefore, it is recommended that performance level be recognized as a significant factor influencing the turnover process.

Responses to Dissatisfaction—Other Than Leaving

Steers (59) argues that current models assume that once an employee has become dissatisfied, the wheels are set in motion for eventual termination. Steers notes that this assumption may not be valid because it ignores the fact that the employee may be able to change his or her current work situation (perhaps through bargaining with the supervisor, threats to quit, etc.). Mobley (32) argues that another failure of current turnover models with respect to job satisfaction is that they ignore the employee's expectations about his or her future with the organization. Employees who are satisfied with their current jobs may leave the organization because they anticipate dissatisfaction in the future (e.g., they see no chance for progression in their career). Conversely, employees who are dissatisfied with their current jobs may remain with the organization because they believe the organization will treat them better in the future.

Consequences of Turnover: Not Always Negative

Recently, several authors have begun to enumerate the positive aspects of turnover [Dalton (65), Muchinsky (33), and Mobley (32)]. For example, personnel cost savings sometimes result from turnover because rates of pay for new hires are lower than rates for experienced employees. Since eligibility for some benefits does not occur until seniority

is established, the company saves money on insurance payments, vacation pay, etc. Third, in cases where those who terminate are poor performers, turnover presents the opportunity to upgrade the quality of the work force. Fourth, when turnover occurs in jobs above the entry level, opportunities for upward mobility are created. Also, new employees sometimes bring fresh perspectives to their jobs that improve the organization's effectiveness. For these reasons, a *lack of turnover* can sometimes have negative effects on an organization, and it is erroneous to believe that turnover is a negative behavioral response that should be totally extinguished.

MEASUREMENT OF TURNOVER

According to Price (17), several measures of turnover have been widely used. The major measures are average length of service, crude turnover rates, instability rates, and survival rates. Each of these types of measures is described and critiqued below.

Average Length of Service

There are two ways of computing average length of service. Since the two computations have different advantages and disadvantages, they are described separately. It should be emphasized that "average" refers to "central tendency." The mean, the median, and the mode are three averages—that is, measures of central tendency. The mean is the most frequently used average and is often wrongly equated with average. The mean is but one measure of central tendency, one kind of average.

Stayers

Description

The first computation, average length of service (stayers), is based on the existing membership (stayers) and is computed as means and medians. The mean is more often used and is computed in the following manner:

$$\text{Average length of service (stayers)} = \frac{\text{Sum of length of service for each member}}{\text{Number of members}}$$

Length of service is usually expressed in months or years (most commonly in years).

The number of members (the denominator) is calculated as of a specific date rather than for a period of time. There is no fixed range within which this measure varies. Since the measure is limited by the lifetime of organizational members, its range cannot be too large.

Criticism

The average length of service (stayers) has three advantages. First, it is relatively easy to compute. Organizations generally maintain readily available membership lists, and little effort is required to locate the date of each member's entrance into the organization. Calculation is also made easier by the fact that this measure does not require data for a period of time; the membership is enumerated as of a specific date.

Second, the average length of service (stayers) is readi-

ly understandable. Nearly everyone understands the mean, the most common way to express this average. However, one possible hindrance to understanding is the fact that a *high* average indicates *low* turnover. For example, an average length of service of 20 yr for an organization would be a high average, but would indicate low turnover. Comprehension would be easier if the direction of the measure (number) were the same as the direction of the interpretation.

Third, it is relatively easy to obtain an adequate size for the average because it is based on the total membership of the unit. The larger the size of the unit, the more stable the statistic—the less the statistic is influenced by minor subtractions and/or additions. Since it is relatively easy to obtain an adequate size, the measure can more readily be used for small units—either organizations or subsystems within an organization.

A very serious disadvantage of this measure is its inability to indicate the high turnover rate of low-service members. If an organization has a relatively large core of high-service members but experiences a very large rate of turnover among its low-service members (a common situation in most organizations), the average length of service will be relatively high. Since the average is based on the number of members as of a single date, it will indicate primarily the lengths of service of the relatively large core of high-service members who will probably be members of the organization on the date the average is calculated. The average will not indicate most of the turnover of the low-service members, only a few of whom are likely to be members on the date the average is calculated. This disadvantage is characteristic of averages as contrasted to rates; averages do not indicate the total number of members who may quit during a period.

Leavers

Description

The second computation, average length of service (leavers), is a relatively recent addition to the measurement literature. This measure is mostly associated with research by Van der Merwe (66-67). The average is based on the members who leave (leavers) and is calculated as follows:

$$\text{Average length of service (leavers)} = \frac{\text{Median length of service of all members who leave during a period}}$$

The previous computation of the average length of service was based on stayers as a single date; this computation is based on all leavers during a period of time. It should be emphasized that this second version of the average length of service is based on all members who leave during a period, not on all members from a cohort of new members. Most frequently, the lengths of service are expressed in months.

Criticism

The average length of service (leavers) has three advantages. First, it is relatively easy to compute. Comparison of the list of members at two times will identify the leavers during the period. Obtaining the length of service for each leaver is usually not too difficult. The personnel office of an organization will typically have a record of when each individual became a member of the organization, and with

these data, the median length of service of the leavers can be computed.

Second, the average length of service (leavers) is readily understandable, although it is easily confused with the more common average length of service (stayers). Organizational researchers are unaccustomed to computing the average length of service of leavers rather than stayers.

Third, the average indicates where, by length of service, turnover is taking place in the organization. If an organization is experiencing a higher rate of turnover among its low-service members than among its high-service members (the customary situation in most organizations), this will be reflected in a relatively low median length of service for the leavers. If for some reason the turnover rate of high-service members begins to increase, this will be immediately reflected in a relatively higher median for the leavers. It is important for an organization to know where turnover is taking place. The loss of experienced members, for example, is much more likely to adversely influence effectiveness than the loss of inexperienced members.

This measure has two disadvantages. First, it is relatively difficult to obtain an adequate size for the average because it is based only on the leavers during a specific period. It takes a fairly large unit to have sufficient leavers to yield a stable statistic. As a result, use of this average is mostly restricted to fairly large units—either organizations or subsystems within organizations.

Second, although this average indicates where, by length of service, turnover is taking place in an organization, it does not indicate how much turnover characterizes the organization. Statements of high and low turnover are inappropriate for the average length of service (leavers). The volume of turnover which characterizes an organization is important because of the costs turnover creates; the greater the volume, the greater the costs. Because of these costs, it is important to know how much turnover is taking place in an organization. The utility of this average is decreased by its inability to indicate the volume of turnover.

Crude Turnover Rates

Description

Two types of crude rates are used to measure turnover; one is based on "accessions" to the organization; the other is based on "separations" from the organization. Turnover includes movement both into and out of the organization. These rates are computed as follows:

$$\text{Accession rate} = \frac{\text{Number of new members added during the period}}{\text{Average number of members during the period}}$$

$$\text{Separation rate} = \frac{\text{Number of members who left during the period}}{\text{Average number of members during the period}}$$

The accession rate and the separation rate require data collection during a period of time; months or years are the usual lengths of time used. Since most organizations are not large enough to have much turnover during a month, data are more frequently collected over a year. A year is also better because any monthly fluctuations will be

"smoothed out." The members who leave during a period are commonly subdivided into different categories. "Quits," "layoffs," and "discharges" are the categories of leavers used by the Bureau of Labor Statistics (30). A separation rate is often computed for each category. The "quit rate" is probably the most commonly used separation rate. The average number of members (the denominator) is typically calculated by adding the number of members at the beginning of the period and at the end of the period and dividing by two [Byrt (68), p. 8, and Gaudet (69), p. 15].

Crude turnover rates are commonly multiplied by 100 and expressed as percentages. There is no fixed range within which the crude turnover rates vary. The rates are always greater than zero. One of the highest rates ever reported for a year was 731 pct for a department in a factory in the Republic of South Africa (56). The separation rate is much more widely used than the accession rate and is probably the most frequently used measure of turnover in the literature (29, 70).

Criticism

Crude turnover rates have three advantages. First, they are quite easy to compute. To compute the more common separation rate, all that is needed is the number of leavers during a period and the size of the membership at the beginning and end of the period. Records maintained by personnel offices commonly indicate the number of leavers during different periods of time. Many personnel offices regularly compute the crude separation rate.

Second, crude turnover rates are readily understandable. Understanding is enhanced by the common use of percentages and the fact that a high percentage indicates high turnover. For example, the 731 pct referred to for the South African factory is high and is interpreted as high.

Third, crude turnover rates indicate all movement into and out of the organization. Consider the crude separation rate for an organization with a relatively large core of high-service members. Since all the leavers during a period enter into the computation, the more frequent movement of the low-service members will be indicated by the crude separation rate. Also, as previously indicated, it is important to know the volume of turnover, because each accession and separation is costly to the organization. The utility of the crude turnover rates is enhanced because they indicate how much turnover characterizes an organization.

There are, however, two disadvantages of the crude turnover rates. First, the rates have no precise meaning. Van der Merwe states this very well, pointing out (67, p. 236) that a separation rate of 100 percent could indicate any of the following:

1. The entire labor force had turned over once during the year.
2. Half the labor force had turned over twice, the other half remaining stable.
3. A quarter had turned over four times, and so on.

These three situations have very different organizational implications. The effectiveness of an organization is probably much more seriously threatened if the entire labor force turns over once during the year than if a quarter of the labor force turns over four times during the year. If every member of the labor force leaves during the year, there will be few experienced members in the organization. However, if all of the turnover is concentrated in one-fourth of the labor force, three-fourths of the members will be ex-

perienced. Because the crude separation rate lacks a precise meaning, this rate does not indicate which of the different situations exists. These comments about the crude separation rate also apply to the crude accession rate. The lack of a precise meaning for the two crude turnover rates diminishes their utility.

The second disadvantage is that the crude turnover rates are misleading because they do not control for variables related to turnover. The most important uncontrolled variable is length of service. As previously indicated, low-service members have higher rates of turnover than high-service members. If an organization is increasing in size, it will be characterized by a high separation rate because of the high turnover rate of its newly hired members. A high separation rate will characterize the organization even if it experiences very little turnover of its high-service members. Organizations with high separation rates are usually thought to be relatively low in effectiveness because of the negative impact turnover is believed to have on effectiveness. However, organizations that are increasing in size are often responding to increased environmental demand for their output, which, in the long run at least, probably portends increased effectiveness. The crude turnover rates are especially misleading when the size of the organization is increasing.

These two disadvantages of the crude separation rate have prompted Silcock, a major scholar in the area of turnover measurement to suggest (71, p. 439) that "it would probably be better to abandon [the rate and] seek an alternative measure." Silcock's comments about the crude separation rate also apply to the crude accession rate. Most recommendations refer to the crude separation rate because it is used more often than the crude accession rate.

Stability and Instability Rates

Description

Stability and instability rates are calculated in the following manner:

$$\text{Stability rate} = \frac{\text{Number of beginning members who remain during the period}}{\text{Number of members at beginning of period}}$$

$$\text{Instability rate} = \frac{\text{Number of beginning members who leave during the period}}{\text{Number of members at beginning of period}}$$

Only the numerators differ for the two rates. The stability rate is based on the number of members who *remain* during a period, whereas the instability rate is based on the members who *leave* during the period. The stability and instability rates require data collection during a period of time. Since the denominators for both rates are based on a number of specific individuals (the number of individuals at the beginning of the period), the rates have a fixed range of up to 100. The two rates are complements of each other. If the stability rate is known, the instability rate may be obtained by subtracting the stability rate from 100. Like the crude turnover rates, the rates are usually expressed as percentages, despite the fact that discussions are often

in terms of rates. This practice, though misleading, is very common.

Criticism

There are three advantages of the stability and instability rates. First, the rates are easy to compute. All that is required is a list of organizational members at two times. Second, the rates are readily understandable. The stability rate is slightly more confusing than the instability rate, however. A high stability rate signifies low turnover, whereas a high instability rate signifies high turnover. If 85 pct of the beginning members remain to the end of a period, this high percentage of stability indicates low turnover. If 85 pct of the beginning members leave by the end of the period, this high percentage of instability indicates high turnover. As previously indicated, comprehension is easier if the direction and interpretation of a percentage are the same.

Third, the stability and instability rates have a precise meaning. An instability rate of 50 pct can be attained in only one way—if half of the members at the beginning of the period leave by the end of the period. This precision arises from the fact that the rates are based on a number of specific members. The utility of the rates is increased by this precision.

The stability and instability rates have two disadvantages. First, these rates do not indicate a sizable amount of the turnover of low-service members. Since the rates are based on membership enumeration at two points in time (the beginning and end of a period), they do not indicate the turnover that takes place *during* the period. If the time period is 1 yr (and this is a common period), this is sufficient time for a sizable number of low-service members to enter and leave the organization. The turnover of these low-service members will be indicated by these rates only if their membership in the organization includes the time at which the rates are calculated (the end of the period).

Second, the stability and instability rates do not control for length of service, probably the most important variable associated with turnover. This disadvantage can be partially corrected, however. If the number of members at the beginning of the period is large enough, the members can be subdivided by length of service, and stability and instability rates calculated for the subdivisions. There could be, for example, an instability rate for members who, at the start of the period, had been with the organization for less than 1 yr. However, this procedure only partially controls for length of service. Returning to the previous example, some of the members who entered the organization 1 yr prior to the beginning of the period may have left the organization by the beginning of the base period and thus would not be included in the calculations. In short, length of service is not perfectly controlled. A partial control, however, is better than no control.

Survival and Wastage Rates

Description

Survival and wastage rates are calculated in the following manner:

$$\text{Survival rate} = \frac{\text{Number of new members who remain during a period}}{\text{Number of new members}}$$

$$\text{Wastage rate} = \frac{\text{Number of new members who leave during a period}}{\text{Number of new members}}$$

What is distinctive about these rates is their exclusive focus on new members. The new members used to determine the survival and wastage rates are sometimes termed a "cohort of new entrants." The length of time required to define the cohort of new members varies. If the organization is large, a month might be used. Usually, however, a longer period is needed to obtain a sufficiently large base to provide a stable statistic. Silcock suggests (72, p. 76) that individuals in a cohort of new members who enter during a given period are treated equally. If 3 months is required to obtain a sufficiently large number of new members, the label "new member" applies equally to all the entrants during the 3-month period.

Two periods of time are required to calculate the survival and wastage rates. The cohort of new members must first be defined by a period of time (e.g., the number of new members during 1 month). After the cohort is defined, a second period must pass before the rates can be calculated. The second period immediately follows the first. Survival and wastage rates are often computed for the same cohort of new members but over different periods of time. For instance survival rates can be computed every 6 months until every member of the cohort leaves the organization. The rates may also be computed for successive cohorts. The first cohort might be the new members who entered the organization during January, February, and March; the second cohort would then consist of the new members for April, May, and June; and so on. There is no limit to the number of successive cohorts for which the rates can be computed. Since there is a fixed number of new members during a period, the survival and wastage rates vary between 0 and 100. These rates are also the complements of each other. If the survival rate is known, the wastage rate can be obtained by subtracting the survival rate from 100. These rates are usually expressed as percentages.

An important concept in the measurement of turnover is "half-life," the length of time required for a cohort of new members to be reduced to one-half its original size. For example, the half-life of a particular cohort might be 20 months. A survival or wastage rate of 50 equals a half-life. At this rate (50 pct), the cohort of new members is reduced to one-half its original size. Thus, a survival or wastage rate of 50 pct is of particular importance. While survival and wastage rates are usually expressed as percentages, half-life is expressed in terms of time.

Half-life is usually defined in terms of a cohort of new members. However, the number of members at the beginning of any period can be used to calculate half-life. Using this base, half-life would be the length of time required for the cohort of beginning members to be reduced to one-half its original size. In short, half-life can be used to indicate stability and instability rates as well as survival and wastage rates.

A 50-pct survival or wastage rate is closely equivalent to expectation of service, when the latter term refers to membership from initial entry into the organization. When expressed in terms of initial entry, expectation of service is the average number of years of organizational life remaining at the beginning of membership. The length of time required for the survival and wastage rates to reach 50 pct

is approximately the average life remaining in the organization for a new member. The difference is that these rates are expressed as percentages, whereas the expectation of service, like the half-life, is expressed in terms of time.

The expectation of service is analogous to the "expectation of life" in demography. Like the expectation of life, expectation of service may refer to periods other than from initial entry into the organization. The expectation of service can be calculated for new members, 1-yr members, 2-yr members, etc. Regardless of the method of calculation, expectation of service refers to the average number of years of organizational life remaining.

Criticism

The survival and wastage rates have three advantages. First, they are easily understandable. No loss of comprehension occurs if the rates are expressed as half-life instead of as percentages.

Second, these rates have a precise meaning. A survival rate of 50 pct for 1 yr has but a single meaning: that one-half the cohort of new members continue to be members of the organization at the end of their first year of membership. The precision of survival and wastage rates rests on the fact that they are based on a number of specific individuals. As previously indicated, the precision of a rates add to its utility. The major (third) advantage of these rates is that they control for length of service by restricting themselves to the new members who enter during a period.

There are two disadvantages of the survival and wastage rates. First, they are somewhat more difficult to compute than the other rates. The focus on new members rather than the total membership is an added difficulty. Extra difficulty is also created by the need to gather data for two periods of time rather than one.

Second, the rates are best adapted to quite large units. Short periods of time, such as a month, should be used to define the cohort of new members. Over longer periods, too much diversity is introduced into the cohort. The new members at the start of the period will be considerably different from the new members at the end, especially when low-service members are the objects of study. However, it requires quite a large organization to obtain in 1 month the cohort of 100 recommended by Silcock. The requirement of a large size also means that subsystems of the organization can seldom be used to compute the rates unless the organization is very large. None of the other rates has an associated "size disadvantage" as serious as that of the survival and wastage rates.

These rates are also criticized (56, p. 415) because of the length of time required to obtain the calculations. A period of time is first required to define the cohort of new members, often several months. A second period must then be allowed to pass before the rates can be calculated. Additional time is required if the researcher decides to follow a cohort until its last member leaves the organization. However, the charge of excessive time does not seem to be valid. The researcher need not begin with a new cohort; past cohorts can be used. The records of the organization can be used to obtain the raw data necessary to calculate the rates.

USE OF MEASURES

This section discusses when to use the various measures that have been described and criticized.

Price (17) argues that the average length of service

(stayers) should not be used. The inability of this average to indicate the disproportionate extent to which low-service members enter and leave the organization is the decisive consideration in rejecting this measure. The survival and wastage rates are the most sophisticated of the measures. Of major importance is the ability of these rates to control for length of service. An important consideration, however, is the required size of the cohort of new members. As indicated earlier, Silcock suggests (71, p. 76) that the cohort should not be allowed to fall below 100. Ideally, these 100 new members should enter the unit during a relatively brief period of time, such as a month. Few organizations—and still fewer subsystems of organizations—will be able to achieve a cohort of 100 new members within a month. Therefore, most organizational research on turnover is not able to use the sophisticated survival and wastage rates. These rates should be used when the organization studied is large.

Multiple measures should be used in most turnover research. The question is, which of the remaining measures should be used? One of the measures should be the crude separation rate. Despite its lack of a precise meaning and its misleading nature, the wide usage of the separation rate is a strong argument for its continued use. The separation rate is used far more extensively than the accession rate. Extensive usage of the separation rate allows for a rough approximation among findings—an advantage not easily dismissed.

CHARACTERISTICS OF THE MINING INDUSTRY AND ITS WORK FORCE

In addition to understanding the findings from previous turnover research, it is important to consider some of the relatively unique characteristics of the mining industry and its work force before attempting to construct a model of the turnover process for miners. Several recent studies about coal miners provide information that is useful for formulating hypotheses about which types of variables should and should not be considered as potential predictors of turnover among underground coal miners. This section presents findings from several recent studies of the mining industry which may be useful for identifying the causes of turnover among miners.

Trends in Employment Levels

The Mine Safety and Health Administration (MSHA) reports annual employment level statistics for the underground coal mining industry (73). According to these statistics, the number of hours worked by underground coal miners declined steadily from 1950 to 1970. However, this trend was reversed in the mid-1970's. Mine employment increased from 188,632,238 worker hours in 1973 to 256,826,740 worker hours in 1979. Beginning in 1980, the trend was reversed once more, and the mining work force began to decline significantly. MSHA reports that only 174,458,913 worker hours were worked at underground coal mines during 1985.

The recent cutbacks in employment suggest that job security is currently an important issue to miners. These cutbacks have several important implications. When reductions in the work force occur, those with the least seniority are usually let go, and many of the remaining employees are assigned to lower level jobs. These layoffs and

If the organization is fairly large but not large enough to use the survival and wastage rates, the average length of service (leavers) measure can be used with the crude separation rate. The two measures complement each other very well. The average length of service (leavers) indicates where turnover is taking place in the organization. A disadvantage of this average is that it does not indicate the volume of organizational turnover. However, this disadvantage is compensated for by the crude separation rate, which does indicate the volume of turnover. Use of this average and the crude separation rate provides two important pieces of information about organizational turnover—its location and volume.

If unit size is a problem, the instability rate can be used with the crude separation rate. These two rates also complement each other. The separation rate lacks a precise meaning, but the instability rate has a precise meaning. A major disadvantage of the instability rate is its inability to indicate a sizable amount of turnover of low-service members, while a major advantage of the separation rate is its ability to indicate the high turnover rate of this type of member. Neither rate, however, controls for length of service—a major disadvantage. The instability rate is slightly easier to understand than the stability rate; therefore, the former rate is the preferred one.

reassignments may cause younger miners to become pessimistic and frustrated with their career outlook. In areas where there are good opportunities for stable employment in other (nonmining) segments of the economy, this pessimism is likely to cause miners to seriously consider working in other types of industries.

Urban Versus Rural Areas

Cohn (74) compared a sample of male mine workers to a sample of nonmine workers matched in terms of sex and occupational skill level, and noted how miners differ from nonminers. It was found that the proportion of miners living in rural areas was much greater than in the matched sample. Almost 60 pct of the miners worked in rural areas, compared with 35 pct of the matched sample. In remote rural areas, the types and number of jobs available to miners outside of the mining industry are usually rather limited.

Education Levels

Cohn notes that miners are, on the average, less well educated than matched nonminers, although this difference is much stronger for older as compared to younger miners. He reports that in 1970, 51 pct of the miners had less than a 9th grade education, compared with 37 pct among the nonminers. However, for miners under 25, roughly 10 pct had less than a 9th grade education, which was nearly equal to the proportion for nonminers of similar ages. This indicates that there may be a significant number of miners whose lack of formal education prevents them from qualifying for most types of jobs outside of the mining industry.

This suggests that the availability of nonmining jobs is an important determinant of turnover only among the more educated miners.

Trends in Career Movement

With respect to trends in miners' entry and exit from a career in mining, the Cohn study indicates that entry into mining generally occurs early in the individual's career, with considerable out-movement and in-movement during the first years. After 5 yr of employment, however, in-movement decreases dramatically. A trickle of out-movement continues over the remaining years of working life.

Pay

According to the National Coal Association (75), miners' wage rates are as high as those of any manufacturing group. However, a study by the National Academy of Sciences (76) found that annual family income in coal mining communities is below the national average. The study suggests that frequent work interruptions and limited job opportunities for spouses are the causes of the relatively low average level of family income. Because it is not likely that miners will be able to find jobs in other industries with higher wage rates, compensation may not be as important a reason for turnover among miners as it is for similarly skilled employees in other industries. However, wage differences are probably a very important reason for turnover within the mining industry. When miners from 15 underground coal mines were recently asked why they had decided to become a miner, they cited "good pay and benefits" much more frequently than any other reason (77). This reason was cited by 68 pct of the sample. The next most common reply was "because a member of my family works at the mine." This reason was cited by only 9 pct of the sample.

Working Conditions

According to the National Safety Council (78), underground mining is currently one of the most hazardous industries. A survey of underground coal miners by Pfeifer (79) indicates that miners believe that, of the things the union does for them, bargaining for safer and healthier working conditions and otherwise putting pressure on the company to provide a safe mine are the most important. This suggests that miners are concerned about the safety of their work environment.

In addition to the relatively high potential for injury-producing accidents, other conditions typically found in underground coal mines include darkness, high levels of noise and dust, dampness, temperatures of about 50°F, and ceilings that are not high enough to permit employees to walk or stand in an upright position. While underground, miners usually do not have access to clean water, toilets, or many of the other "necessities" which employees in other industries take for granted. In addition to the physical discomforts caused by the underground environment, some miners may experience some psychological discomfort due to feelings of being "closed in" and isolated from the world outside. These conditions suggest that physical aspects of the work environment may be an important cause of turnover for miners.

Lifestyle and Culture

To further understand what is and is not likely to cause miner turnover, it is also important to consider nonwork factors. Goodman (5) provides the following description of the lifestyle and culture of miners from central Pennsylvania:

Miners' life experiences have a somewhat narrow focus. Most were born in the area where they currently live, and expect to stay there. They have travelled very little. The focus of their everyday activities is in the current geographical area, where opportunities to broaden their experience are few.

The work experience for most of the men has been in mining, and almost all of them have relatives who have been in mining. Many of those with no experience in and/or connections with mining have worked in jobs similar to mining, such as construction or timbering.

Miners consider their work to be legitimate and desirable. It is a job that has been performed through the generations, and it is a socially acceptable occupation. Another cultural theme is one of autonomy or independence. The men exhibit strong preferences for behaving autonomously. Mining throughout the years has been a very autonomous activity and very likely the nature of the work has reinforced the miners' personal preference for work that is relatively free from close supervision.

Performing concrete, physical, "masculine" activities is another major dimension of the miner's life, both on and off the job. Miners often report that they spend their holidays or free time building things, making repairs to their home, hunting or fishing. Most of the miners felt that their job was NOT the central part of their life; home and other nonwork activities were more central.

Although this description is not an accurate portrayal of all mines and miners, it may be fairly representative of a large portion of the underground coal mining work force, and has several interesting implications for understanding turnover.

Goodman's study indicates that miners' ties to their family and the local community are often quite strong, and that their knowledge of (and desire to live in) faraway communities is apt to be quite limited. This suggests that ties to people in the local area and responsibility for supporting a family or relatives are likely to be important determinants of whether or not miners will consider job opportunities that are beyond a reasonable commuting distance from where they presently live.

The Goodman study indicates that miners consider it important to have time for family and other nonwork activities. However, most miners spend a significant portion of their time working evening and night shifts. This suggests that another important determinant of turnover may be the extent to which miners' work schedules prevent them from participating in family and social activities.

The Goodman study also indicates that miners' have a strong desire to work autonomously (with little supervision). This suggests that overly close supervision could be an important cause for turnover.

In summary, the studies discussed in this section have provided several clues about which variables are and are not likely to be important determinants of miners' turnover.

It is concluded that the following variables are potentially useful for understanding and predicting whether or not miners will choose to remain with their present employer: pay, style of supervision, safety, working conditions, job

security, opportunity for family-social activities, and kinship responsibilities. A causal model of miners' turnover including these and a few other variables is presented in the next section.

A MODEL OF THE TURNOVER PROCESS FOR UNDERGROUND MINERS

Using the findings from research on employee turnover from other industries and what is known about miners and the mining industry, a conceptual model of the factors that produce turnover among miners was generated (fig. 1). Predictions regarding the direction of the association between the variables in the model are indicated by the words "plus" or "minus." Definitions for the variables are given below.

Career expectations—The degree to which miners expect their mine will have available the types of jobs they will want to perform.

Intent to stay—The estimated likelihood of continued employment at the mine.

Job satisfaction—The degree to which miners like their jobs.

Kinship responsibility—The extent of a miner's obligations to relatives in the community where the employer is located.

Opportunity—The availability of alternative jobs in the mine's environment.

Satisfaction with conditions of work—The degree to which miners like and/or dislike the physical aspects of their work environment.

Satisfaction with coworkers—The degree to which miners view their coworkers as friendly and cooperative.

Satisfaction with supervisor—The degree to which miners view their supervisor positively.

Satisfaction with job content—The degree to which miners like their work.

Satisfaction with job security—The degree to which miners are satisfied with their future chances of being able to work for their current employer.

Satisfaction with opportunities for family and social activity—The degree to which miners are satisfied with their opportunities to interact with their family and friends.

Satisfaction with pay—The degree to which miners are satisfied with the amount of money or equivalents distributed in return for service.

Satisfaction with safety—The degree to which miners are satisfied with their personal safety while at work.

None of the variables in the model refer to "correlates," such as age, length of service, or existence of a union. Correlates (sometimes termed demographic variables) are not included in the model because they do not indicate the means whereby they produce variations in turnover. Age illustrates this. Quite a substantial literature (17) supports a negative relationship between age and turnover: Younger members usually have higher rates of turnover than do older members. Age, however, does not indicate *how* or why the younger age produces higher rates of turnover. An answer to the "how" question can be found among the variables defined above. Younger members have higher rates of turnover than older members because they usually have the less desirable jobs; are less satisfied (or are

dissatisfied) with pay, coworkers, and job content; have fewer close friends in the organization, and have fewer local obligations to kin. In short, it is not age per se that produces variations in turnover, but kinship responsibility and satisfaction with various aspects of the job, both of which are correlated with age.

The position taken here on correlates may seem trivial to some, but the distinction between correlates and the model variables is an important one when the objective is explanation rather than prediction. If the goal is to arrive at a set of variables that will maximally predict who will and who will not leave the organization, then there is nothing wrong with including variables such as age and length of service—in fact, any variable correlated with turnover should be included. However, if the goal is to explain turnover, e.g., to indicate why those who are younger and those with short service records leave more often, one must look toward theoretically relevant constructs, such as those defined above. Turnover researchers have shown conclusively that age and length of service are good predictors of turnover, but the reasons why this is so have not been explained.

Working backwards through the model, it is hypothesized that voluntary turnover is negatively associated with miners' intent to stay and positively associated with the perceived chances of finding work elsewhere. Miners' intent to stay is positively associated with job satisfaction, kinship responsibilities, and career expectations. Various components of overall job satisfaction are also listed in figure 1. These components are all positively related to overall job satisfaction. They are discussed below.

Job Opportunity (at Other Companies)

In addition to wanting to leave his or her current job, the miner must perceive that he or she has other job opportunities, in order for turnover to occur. Therefore, this variable reflects what miners hear about job opportunities at other nearby mines and, to a lesser extent, the availability of jobs in nearby nonmining businesses. Thus, it is hypothesized that job opportunity is positively related to turnover.

Kinship Responsibilities

This variable is important to consider because most miners are responsible for supporting a family (80). Obviously, it is easier for miners who are young and unmarried to leave a job than it is for older persons with families to support. Therefore, it is expected that kinship responsibilities are positively related to intent to stay.

Career Expectations

The career path of miners is fairly well defined, especially in unionized operations. Promotion among underground

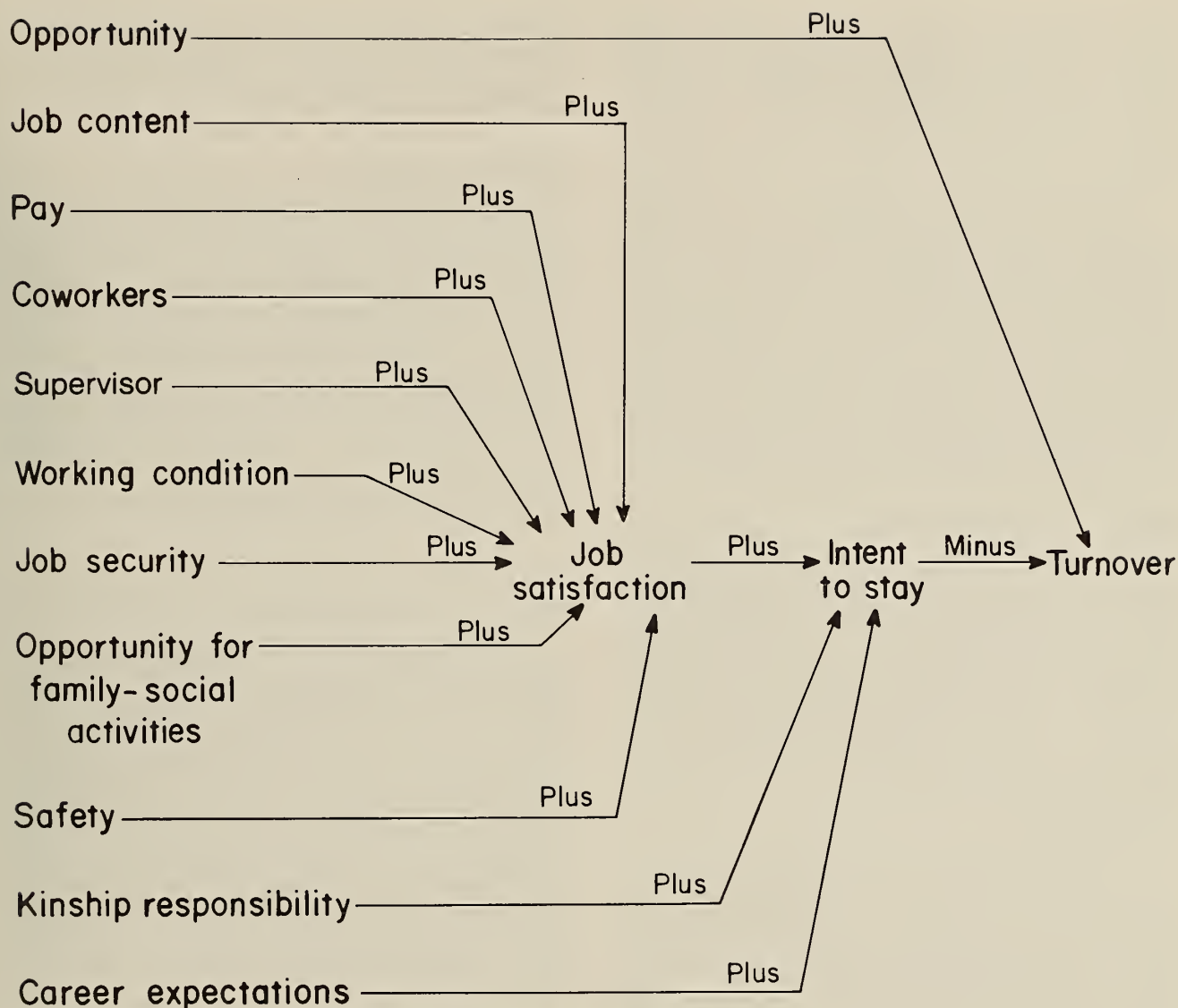


Figure 1.—Causal model of miner turnover.

miners usually implies moving into jobs that are somewhat higher paying and are likely to be less physically demanding and perhaps more intrinsically satisfying (i.e., the work is perceived as more important and more interesting). Miners who have reached the top of their career path and do not wish to remain in that job indefinitely might be likely to leave if they become aware of an attractive job elsewhere.

In some cases, miners may possess skills that qualify them for jobs in mine management or jobs outside of mining. For instance, during the past few years, several young people have graduated with college degrees in mining engineering or some related field, and because they could not find professional-level jobs, have chosen to take entry-level jobs in a mine. One would expect that these individuals will be likely to leave their jobs whenever they are able to find professional-level jobs. Of course, if the management job is within the same company, this should not be considered turnover. It is hypothesized that intent to stay will be positively related to the degree of congruency between a miner's career goals and his or her opportunities to realize these goals if he or she should choose to stay with the present employer.

Overall Job Satisfaction

This variable is hypothesized to be positively related to miners' intent to stay. Although it is natural to assume that such a relationship exists, several studies have been unable to empirically confirm it. For practical as well as theoretical reasons, it would be valuable to know which specific facets of job satisfaction are most strongly related to turnover. Therefore, the following variables should also be included:

Satisfaction With Job Content

Jobs in underground coal mining vary in terms of the degree to which miners derive satisfaction from performing them. Some jobs are more challenging, more interesting, more dangerous, less repetitive, more free from supervision, or less physically demanding than others. Some require fewer skills and are perceived as less important than others. Miners' job satisfaction or dissatisfaction is determined by both the characteristics of the work and the characteristics of the individual. Satisfaction with job content reflects the degree to which the characteristics of a miner's work are

congruent with the miner's interests, desires, and capabilities. Mobley (32) reports that satisfaction with job content is one of the most consistent indicators of turnover. Therefore, it is hypothesized that this variable is positively related to miners' intent to stay.

Satisfaction With Pay

This variable is hypothesized to be positively correlated with miners' intent to stay. However, it is likely that pay satisfaction is not as important a predictor of turnover for the mining industry as it is for other industries. Given that miners typically lack the qualifications for better paying nonmining jobs, and that miners' pay rates are above the average pay rates of employees in similarly skilled occupations, it is usually difficult for miners to find higher paying jobs in nonmining occupations. Also, many miners are geographically isolated from other industries. Thus, in order for miners who work in such areas to enter a different occupation, they would have to relocate their families.

Satisfaction With Coworkers

This variable is believed to be positively related to miners' intent to stay. The work involved in underground mining is generally performed by small crews of approximately 10 or fewer people. These crews are physically isolated from one another, and as previously mentioned, the work demands much coordination between crew members. Therefore, it is critical that miners develop good relations with their coworkers. This variable is considered a more important predictor of turnover for miners than for employees in other industries.

Satisfaction With Supervisor

This variable is hypothesized to be positively related to miners' intent to stay. Several components of the supervisor's behavior are important to consider. As previously mentioned, miners do not expect close supervision, and may become annoyed with supervisors who do not allow enough freedom. Also, the supervisor is an important source of feedback to the miner about how or she is performing. The supervisor is responsible for allocating work assignments, resources, and various nonmonetary rewards and punishments to the crew. Therefore, it is important that the supervisor allocate rewards and resources equitably, give assistance and guidance as needed, and give miners adequate feedback concerning their job performance.

Satisfaction With Conditions of Work

This variable is hypothesized to be positively related to miners' intention to stay. This variable is considered a more

important predictor of turnover for miners than for employees in other industries. As previously mentioned, the physical environment creates several types of discomfort for those who work underground

Satisfaction With Safety

The psychological fears associated with underground mining are an important consideration. The possibility of death or severe harm from falling rock, entrapment, explosions, and inundation is likely to detract from miners' desire to work underground. It seems likely that news of unsafe conditions, accidents, or mining catastrophes might cause miners to think about quitting mining. A miner's desire to quit mining in order to avoid harm might be significantly strengthened by the miner's family, since they would be likely to suffer emotional and economic hardships if the miner were killed or disabled. Due to the hazards associated with mining, safety satisfaction is probably a more important predictor of turnover for the mining industry than it is for most other industries.

Satisfaction With Job Security

Recent layoffs and mine closings have resulted in much concern over job security among miners. This fear of job loss may cause miners (especially younger men) to want to go into another occupation. A related source of concern to miners is the life expectancy of the mine. Obviously, as miners realize that there is not much coal left in their mine, they may begin to think about looking for work at another mine. Most likely, a miner would be more interested in work at a mine whose life expectancy is at least as long as the remainder of his or her career. It is believed that in times of low unemployment, satisfaction with job security is positively related to turnover. However, satisfaction with job security is unrelated to turnover in times of high unemployment (because there are no other jobs available).

Satisfaction With Opportunities for Family-Social Activities

A significant portion of the time most underground coal miners spend at work is during evening and night shifts. Because miners who must work these shifts may have limited opportunities to do things they enjoy with their family and friends, they may want to find day-shift jobs. Therefore, it is expected that the degree of miners' satisfaction with opportunities for family-social activities will be positively related to miners' intent to stay.

RECOMMENDATIONS FOR CONTROLLING MINER TURNOVER

Given the complex, multifaceted nature of turnover, there are obviously no panaceas or pat prescriptions for managing miner turnover. A fundamental point is that management responses to turnover must be based on diagnosis and evaluation of the causes and consequences of turnover in the context of the particular mine and mining company. The objective of this section is to focus on some

of the areas that may need more effective turnover management. For each area, several diagnostic questions are provided. Most of these questions have been derived from Mobley (32). The data for answering these diagnostic questions can come from several sources, including—

1. Personnel records.

2. Regular employee surveys.
3. Exit interviews.
4. Followup surveys of employees who leave.
5. Competitive analyses to include factors in addition to monetary compensation.

Surveys and interviews should assess not only present job perceptions and attitudes, but also expectations regarding the individual's career, perceptions of alternative jobs, nonwork values, and intentions to stay. Only after valid diagnostic information on the causes and consequences of turnover has been gathered can effective turnover management and control strategies be designed.

The sections that follow discuss areas in which turnover can be most effectively managed. These areas include recruitment, selection, and early socialization; job content; pay practices; supervision; career management; and other opportunities for effectively managing turnover.

RECRUITMENT, SELECTION, AND SOCIALIZATION

The processes by which miners choose and are chosen for jobs offer a number of important opportunities for effective turnover management. The organizational entry process is one of matching the miner and company. This matching is based on the miner's aptitudes and abilities relative to the job requirements and the miner's values, preferences, and expectations relative to the company's norms, policies, practices, rewards, and conditions.

The traditional approach to the matching process is based on the company's assessment of the individual relative to job requirements. Standardized tests, work samples, interviews, weighted application forms, and biographical inventories are among the traditional employee selection techniques which, when validated, may be useful selection techniques. The literature suggests that these traditional employee selection techniques can predict turnover. Although the ability of individual tests to predict turnover is not particularly strong, such predictors, when used in combination, are important to turnover management.

If the matching process is to be effective, both the miner and the employer must be actively involved. Too frequently, prospective and new employees have inaccurate information and unrealistic expectations. The literature indicates that realistic recruitment and selection can enhance the matching process, increase satisfaction, and reduce voluntary turnover (81).

The realistic job preview (RJP) is one way a company can enhance realism. Not a single technique, the RJP is rather a philosophy or approach. This philosophy or approach assumes that giving candidates and newcomers accurate and complete information will result in better matching, increased satisfaction and commitment, and lower turnover. The realistic information can be transmitted through booklets, films, mine tours, video tapes, realistic work samples, interviews, supervisors, other recent hires, or combinations of these approaches.

The time immediately after a miner joins the company is important in shaping the miner's attitudes and behavior. The new miner should be provided with accurate expectations of what the job requires and the company expects; a clear understanding of reward contingencies; and assistance in establishing a social support system among fellow crew members, the supervisor, and others. Such early socializa-

tion may take several months. This sort of systematic early socialization is substantially different from the traditional several-hour new miner orientation program.

Many employers have a probationary period as a matter of policy or contractual agreement. Yet the probationary period frequently is not effectively used. To be effective, the probationary period should provide systematic evaluation and feedback to the new miner, coaching and counseling, and joint employee-employer evaluation of the probable success of a continuing employment relationship. The probationary period can be considered an extended job trial. If the employer and/or miner conclude there is a mismatch, individualized training and development, transfer, or termination may be appropriate. Given the fact that miner selection and early socialization procedures will not always result in a suitable match, early transfer or termination of some miners will be both inevitable and desirable from both the miner's and the company's perspectives.

Given (1) the fact that both miners and employers change, (2) the current state of researchers' ability to measure and effectively match miners and employers, and (3) the fact that early turnover may be positive or negative, it would be naive to assume that the recruitment, selection, and early socialization processes are the only answer to effective turnover management. However, these processes are clearly important for effective turnover management and are underdeveloped in many mining companies.

Diagnostic questions relevant to recruitment, selection, and early socialization include the following:

1. Is early turnover evident?
2. Can mismatches in aptitude and ability be identified?
3. Are new miners entering the company with unrealistic expectations?
4. Does the recruiting and selection process include means for transmitting realistic job information?
5. Has the utility of the techniques used for selecting miners been evaluated?
6. Does the company's entry process include mechanisms for teaching coping skills, communicating role expectations and reward contingencies, and building social support systems?
7. Has an effective probationary period been developed that includes systematic evaluation, feedback, coaching, and counseling?

JOB CONTENT

As noted previously, employee perceptions and evaluations of job content are one of the more consistent correlates of turnover. To the extent that miners value tasks with meaningfulness, identity, significance, feedback, and variety, designing jobs with such qualities should enhance satisfaction with job content and decrease turnover. To the extent that goals are unclear, feedback is indirect or delayed; variety is diminished through high specialization and routinization; and accountability, discretion, and self-control are minimized. Where these conditions are present, jobs will become boring or frustrating to miners who seek task meaningfulness and identity. However, not all miners value an "enriched" job, and the redesign of all mining jobs is not feasible. Thus the issue is one of effectively matching miners' abilities, interests, and values with task requirements. This may be accomplished in two nonmutually exclusive ways: selection- and placement-based strategies

(tests, interviews, realistic job previews, job trials) and job design strategies.

As the average education and expectations of the mining work force increase, as work values move more toward a stronger desire for meaningfulness; and as selection ratios become less favorable in the tighter labor markets projected for the remainder of the century, job design strategies may take on added significance. Companies whose profit margins do not permit wage competition in a given labor market may find that meaningful jobs will be an effective way of competing in the labor market.

The following are examples of diagnostic questions in the area of job content:

1. Do miners (and applicants) value task meaningfulness and identity?
2. Is dissatisfaction with job content related to turnover at this mine?
3. Is job redesign feasible?
4. Would job redesign make the mine more competitive in the local labor market?
5. Are the costs and consequences of turnover such that turnover is preferred to the costs and/or benefits of job redesign?

COMPENSATION PRACTICES

While research indicates that differences between companies' pay rates are related to turnover rates, this relationship is far from perfect and does not address the individual-level prediction of turnover. It is apparent that companies must continue to assess the competitiveness of their wages and benefits in the relevant labor markets. Wage and salary surveys are widely used for this purpose and need not be detailed here.

However, several caveats are noteworthy. In regions experiencing an in-migration of new industry, an employer must anticipate the impact of the new industry on the local market. Advance management assessment of the impact of the wages and benefits of new industry permits timely evaluation of strategies to address the new competition. To wait until after the new industry arrives risks disruptive levels of employee migration. For example, Mobley (32) reports that it recently took a division of a large corporation 12 months to get approval to adjust its salary scale after a new employer moved into the local labor market. During this interval, some 40 pct of the work force migrated to the new industry. If an employer is unable to be wage-competitive in the market, careful attention must be given to other factors that allow the employer to recruit and retain a competent work force, such as job content and supervision.

Miners' compensation must not only be competitive relative to the labor market, it must also be internally equitable; i.e., there must be appropriate differences between the compensation for different jobs within the mine. A well-developed and well-understood job evaluation process is important for maintaining internal equity. Job evaluation procedures are well documented in a number of sources and are not discussed here. (See reference 82.)

Pay, Performance, and Turnover

If pay is a reward valued for what it will buy and/or for what it signifies (for example, recognition, attainment, status, etc.), and if individual performance is measurable

and employee-controllable, then making a strong link between pay increases and performance may be a useful motivational strategy. Even in cases where individuals are dissatisfied with the absolute amount of their pay increases, pay can still have a positive influence if the *relative* amount of pay increase is related to performance.

A relevant managerial question concerns *who* is dissatisfied with their pay—the good or the poor performers? Many managers argue for across-the-board increases. The effect of this undifferentiated reward policy is to reward incompetence and penalize competence. The poor performer is signaled that performance is not relevant to pay, and is reassured that he or she got the same increase as everyone else.

The good performer also is signaled that performance is not relevant to pay, and is likely to be dissatisfied that his or her good performance was rewarded in the same way as the performance of the poor performer. The good performer's response may be to lower performance or, if alternative jobs are available, to quit. As noted previously, the consequences of turnover are significantly different for good versus poor performers.

Pay is not the only important reward, but it is the most tangible company-controlled reward, and thus is a potent signal. Failure to give greater rewards to good rather than poor performers may contribute to turnover among those individuals a company would least like to lose. While valid measures of performance may be difficult to accomplish, it may also be true that managers too frequently avoid establishing a pay-performance contingency even when performance can be adequately categorized for differential rewards.

Sample diagnostic questions in the area of compensation include the following:

1. Are systematic wage surveys conducted to assess competitiveness in relevant labor markets?
2. Has there been a recent attempt to systematically evaluate miners' jobs?
3. Are timely wage adjustments made in response to particularly competitive occupations?
4. Is the impact of new industry in the area being anticipated?
5. Where wage competition is not feasible, are alternative competitive strategies developed?
6. Are the performance and earnings of leavers versus stayers being analyzed?
7. Does a performance-contingent pay increase policy exist?
8. Do employees see the link between pay increases and performance?
9. Are high-performance leavers less satisfied with pay practices than stayers?

Supplementary Benefits

A competitive supplementary or fringe benefit package may contribute to attracting and retaining employees. A recent national survey of coal miners suggest that this may be a particularly important issue for the mining industry. Goodman (80) reports that, in comparison with other aspects of their jobs, miners' satisfaction with their supplementary benefits is quite low.

The increasing percentage of total payroll costs devoted to such benefits dictates that they be well-managed. The competitiveness of a company's benefits can be assessed via benefit surveys, which are conducted in much the same way

as wage surveys. However, it is important to recognize that it is the miner's *perception* of the competitiveness of the benefits that controls the influence on turnover. If benefits are competitive, the company should communicate this fact.

The concept of "cafeteria" benefit plans, under which employees are able to choose, within limits, how they wish to allocate their benefit dollars, is conceptually appealing. Such plans allow better matching of miners' values and needs with benefit options. Although such plans have not been widely adopted, perhaps due to concern about possible administrative costs, they continue to be worthy of consideration.

A fundamental problem with benefits, from a turnover perspective, is that generally they are not performance-based. Thus they are available to all employees or to the employees in various broad categories, such as exempt, non-exempt hourly, salary, etc. As such, a highly competitive benefit plan may serve to discourage turnover among habitual poor performers. To the extent that this is the case, the company may find it useful to consider diverting a portion of the total benefit cost to benefits or rewards that are performance-contingent. The effect would be both to reward good performance and to discourage turnover among good performers.

Sample diagnostic questions in the area of turnover and benefits include the following:

1. Are benefit plans competitive?
2. Do miners perceive the competitiveness of the benefit plan?
3. Would "cafeteria" benefit plans increase the value of benefits to miners and the company?
4. Can a portion of the benefit cost be diverted to performance-contingent rewards?

LEADERSHIP AND SUPERVISION

Employees' values and rewards, both of which are fundamental to miners' attachments to the company, can come from several sources. As previously discussed, job content is a primary source of intrinsic reward, i.e., attainment of such values as task meaningfulness and identity, while compensation is the most tangible form of extrinsic reward. However, the immediate supervision also can be an important source and facilitator of rewards and value attainment and can play an important role in turnover management.

The supervisor controls a significant reward—praise. Given the time demands on many supervisors, inadequate attention is given to the basic, yet important, supervisory task of praising employee performance. When supervisor-employee interaction is analyzed, it is frequently found that supervisors spend more time criticizing than praising employees and their performance. An established principle of reinforcement theory is that the source of reinforcement and the situation surrounding positive reinforcement—in this case, the supervisor giving praise—builds positive attachment to the source and situation. Training supervisors in the effective use of praise and positive reinforcement is worth exploring from both work-motivation and turnover perspectives. To the extent that the supervisor establishes a positive personal relationship with his or her crew, demonstrates consideration for the miner, and creates a supportive environment, the miner may become less likely to quit, because of personal attachment to the supervisor.

Another way the supervisor can contribute to effective turnover management is to be a facilitator of miners' task

attainment. By creating conditions under which achievement is possible, by providing feedback and recognition, and by removing obstructions to performance, the supervisor contributes to both task accomplishment and reward. Also, supervisors must establish contingencies for the rewards they control. The supervisor who fails to develop an environment in which goal attainment is valued and rewarded may be contributing to turnover among the potentially better performers. Furthermore, the failure of the supervisor to establish reward contingencies may reinforce poorer performers who should either be trying to improve their performance or seeking another type of job.

The supervisor can also play an important role in the early socialization of new miners. The supervisor is a primary source of role information, role expectations, feedback, and social support for the new miner. Important supervisory activities with respect to new miners include aiding the new miner by reducing the ambiguity of the new situation (particularly important for those who have never before worked underground); teaching the formal and informal cues, norms, and communications networks; clarifying and negotiating goal and reward expectations; and shaping new miners' behavior by reinforcing successively closer approximations to desired role behavior.

The supervisor plays an important role in miners' training and career development. Through open discussions with miners regarding their training needs and career aspirations, and working to create appropriate training and development opportunities, the supervisor can facilitate the internal development of miners and enhance their future-oriented attachment to the company.

Supervisors occasionally play a far too passive role in miners' training and development. To counter this, companies must establish clear goals and reward contingencies for the supervisor's role in training and development of miners. Further, the company must provide support for supervisors with policies, practices, procedures, and training which permit attainment of the objectives discussed in the preceding paragraphs.

Among the diagnostic questions in the area of supervision are the following:

1. Are supervisors developing a supportive work environment?
2. Are supervisors facilitating miners' task attainment?
3. Are supervisors establishing reward contingencies?
4. Are supervisors trained in effectively managing the role-learning and assimilation of new miners?
5. Are supervisors active participants in the training and development of their crew?
6. Is the company providing supervisors with procedures, training, and rewards for accomplishing the preceding objectives?

CAREER PLANNING AND DEVELOPMENT

Turnover is related to present satisfaction and future expectations and evaluations of jobs and roles within and outside the company. For miners who value learning and/or refining their skills and abilities, and who seek to improve their job performance, company-supported training and development can contribute to job satisfaction.

Although miners may be satisfied with their present jobs, they may leave because they do not anticipate satisfying future roles. In addition, valued employees may

become more prone to quit as changes evolve in their career path, personal aspirations and values, and family life. Earlier, the recruitment and selection process was characterized as a matching process. However, this matching process extends beyond initial selection and can be considered to be ongoing throughout a miners' career.

In more specific terms, employers need to provide miners with accurate information about their career paths, accurate feedback on their assessed potential for success in their careers, opportunities for valid self-assessment, rewards for self-development, and developmental opportunities and programming. Among the important components of a viable career planning and development process are broad-based job-posting systems, career and personal counseling, regular assessment of miners' career interests, and reward systems for subordinate development (i.e., getting the education or experience needed to qualify for more advanced jobs).

As previously stated, it is the miners' values, expectations, and perceptions of internal development opportunities that guide their turnover decisions. Although the company may have a rational career-development path outlined for a miner, if the miner does not perceive and positively evaluate this path, turnover may be the outcome. Furthermore, a positively evaluated career path at one point may not be so evaluated later. There is no alternative to a continuing, two-way dialogue between miners and their employers if the career planning and development process is to be effective.

Among the diagnostic questions in the area of career planning and development are the following:

1. Are employees actively involved in their own career planning?
2. Are opportunities for self-assessment, information on career possibilities, and rewards systems for self and subordinate development provided?
3. Are high performers or "high potentials" leaving for lack of career-development information or opportunities?

OTHER OPPORTUNITIES FOR EFFECTIVE MANAGEMENT OF TURNOVER

Security

Companies that are subject to fluctuations in employment levels may experience difficulty in retaining employees due to fear of layoffs. Some unions have attempted to address this issue by negotiating supplemental unemployment benefits. Mobley (32) reports that several nonunionized firms have created a "security fund" which is used to buffer economic layoffs by offering paid vacations to senior employees, thus keeping employees with less seniority on the payroll. Job sharing is an alternative; reduced scheduled work hours are shared among employees, thus minimizing layoffs. Security funds or job sharing may serve to buffer some of the impact of economic downturns and thus may help reduce turnover that results from job insecurity. Obviously, careful study of the economic implications of such strategies is required before they are implemented.

Working Conditions

The physical aspects of the work environment in which underground mining takes place must not be overlooked. The increased regulation, publicity, and general awareness of mine safety, together with the physical discomforts of working underground, lead to the hypothesis that working conditions will be an increasingly important factor in the recruitment and retention of miners. Work environments that are physically and psychologically safe and desirable are a worthy goal from a turnover perspective as well as from broader organizational and societal perspectives.

Team Building

Just as job content, the supervisor, etc., can be sources of attachment to the job, so can the crew or work group with whom the miner interacts. Recent literature on team building should be of interest to companies seeking more effective turnover management. (See references 83 and 84.)

SUMMARY AND CONCLUSIONS

High turnover among underground miners seriously hampers productivity and is a threat to miners' safety. Therefore, it is important to understand what factors lead to miner turnover and what can be done to control it. Although there have been no attempts to empirically determine the causes of miner turnover, there have been numerous attempts to determine the causes for turnover among employees of other industries. Using the findings from research on employee turnover from other industries and what is known about miners and the mining industry, a conceptual model of the factors that produce turnover among miners was generated. This model posits that the factors that determine whether underground miners remain with their employer or leave are intent to stay with the present employer, the existence of opportunities to work elsewhere, kinship responsibility, career expectations, and satisfaction with various aspects of the job. These aspects

of job satisfaction include job content, pay, coworkers, supervisor, physical aspects of the environment, job security, safety, and opportunities for family and social activities. Opportunities for controlling miner turnover more effectively are present within each of several key areas of human resource management. Several such opportunities were identified and discussed.

It is recommended that the model of factors believed to produce turnover among underground miners be subjected to an empirical test. Given the current level of unemployment in the mining industry, it is not feasible to conduct such a test at this time. However, more turnover is expected as the economy continues to improve. Therefore, it should be possible to test the model and provide better advice concerning the control of miner turnover within the next few years.

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⁵A title enclosed in parentheses is a translation from the language in which the work was published.

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APPENDIX—RESEARCH STUDIES ON EMPLOYEE TURNOVER PUBLISHED SINCE 1981¹

41. Avner, B., S. Guastello, and M. Aderman. The Effect of a Realistic Job Preview on Expectancy and Voluntary Versus Involuntary Turnover. *J. Psychol.*, v. 111, No. 1, 1982, pp. 101-107.

Method

The sample was 437 applicants for employment as cashiers with a midwestern chain of self-service gasoline stations during June, July, and August of 1978. The experimental group of subjects received a two-page summary of the job depicting both positive and negative aspects at the same time they were handed the application form. This preview was derived empirically, through responses obtained from a survey and 40 interviews with existing employees. Subjects in both the experimental group and control group (who were not given the two-page job preview) completed a job expectations questionnaire.

Results

The turnover rate for this job was in excess of 500 pct. The median tenure was 26 working days. The experimental group showed significantly more realistic job expectations than the control group did and stayed on the job significantly longer than the control group. The difference in tenure between voluntary and involuntary terminees was not statistically different. The authors note that most research suggests that realistic job previews have a small, positive, but not always significant impact on turnover.

42. Bardo, J., and R. Ross. The Satisfaction of Industrial Workers as Predictors of Production, Turnover and Absenteeism. *J. Soc. Psychol.*, v. 118, 1982, p. 29-38.

Methods

The sample was 4,069 employees from 62 departments of a major aerospace corporation. Fifty-three percent were male. Twenty-six departments were production oriented, and the others were involved in production support, engineering, administration, and sales. All employees completed a questionnaire measuring attitudes toward compensation, supervision, job commitment, coworkers, work pace, job stimulation, job security, and worker trust. Turnover was measured for 1 yr after the questionnaire was administered.

Results

Zero-order correlations indicated the following: Turnover in the production department was significantly correlated to satisfaction with coworkers and compensation in the positive direction, i.e., those more satisfied with their coworkers and compensation were more likely to leave the organization. Turnover in the whole division was

significantly related to satisfaction with supervision and coworkers, job commitment, and perceived job security and worker trust. All correlations were relatively low, and all but coworker satisfaction were in the expected negative direction. Turnover in the nonproduction departments was significantly related to job commitment and worker trust in the negative direction. The following findings were determined using regression analyses: For the division as a whole, worker trust and coworker satisfaction were the only significant predictors of turnover. For production departments, only quality of compensation predicted turnover. For nonproduction departments, worker trust and coworker satisfaction predicted turnover. This study suggests that turnover findings from production workers are not generalizable to nonproduction workers and vice versa. Nearly all employees expressed relative dissatisfaction with their compensation at this organization; thus, compensation may have been interpreted by employees as a dissatisfier rather than a satisfier.

85. Dean, R., and J. Wanous. Effects of Realistic Job Previews on Hiring Bank Tellers. *J. Appl. Psychol.*, v. 69, No. 1, 1984, pp. 61-68.

Methods

The sample was 249 newly hired bank tellers. Tellers were randomly assigned to one of three job preview groups. One group was given both specific and general information, another group was given mostly general information, and a third group was given no information about the job. Job offer acceptance rates were virtually identical across the groups, ranging from 69.0 to 71.6 pct. Turnover was monitored for the first 43 weeks of employment for all tellers. The Job Descriptive Index was administered on each teller's first day of work to assess the effects of the previews

on initial expectations. Eight weeks after starting their jobs, tellers responded to attitude scales that assessed organizational commitment, their desire to remain employed at the bank, and their perceptions of the bank's honesty and concern for new employees. Quality of job performance was assessed as follows: number of days without errors/number of days scheduled.

Results

Previews were found to have the expected effects on initial job expectations; i.e., the "specific realistic" job preview group had significantly lower expectations of the desirability of their future jobs than the other groups did. However,

¹These studies are listed in alphabetical order by author and are numbered in the same manner as in the list of references that precedes the appendix.

8 weeks after beginning their jobs, the "specific" preview group expressed significantly lower interest in remaining at the bank, and had significantly lower opinions of the bank's honesty and concern for them than the other two groups did. These two results are contrary to what was expected. No differences were found between groups in the quality of job performance. There were no overall differences in job survival rates among the three groups. Contrary to predictions, the proportion of tellers who quit during the first three weeks on the job (the period of training) was significantly greater in the preview group. Conversely, during the 20 weeks following the 3 weeks of training, the proportion of tellers who left was significantly higher for the

no-preview group than it was for the two realistic preview groups. The authors suggest that, by causing turnover to occur earlier, during training, the realistic job preview was able to reduce the bank's replacement costs. The authors account for the unexpected effects of the realistic job previews as follows: Newcomers in the realistic job preview groups were made skeptical about their jobs by the preview, and only needed the additional experience and information obtained during training to conclude that it was time to leave. In contrast, the no-preview recruits may have needed additional experience after training to confirm skeptical feelings that were first aroused during training.

43. Dreher, G. *The Role of Performance in the Turnover Process*. *Acad. Manage. J.*, v. 5, No. 1, 1982, pp. 137-147.

Methods

This study examined performance, potential aptitude, and career advancement differences between employees who voluntarily resigned and those who stayed with Exxon Corp. The sample consisted of 529 technical and professional Exxon employees hired since 1964.

Hypotheses

Stayers will receive higher initial performance appraisals than leavers. Initial job level of stayers will be

higher; stayers will receive higher initial potential estimates than leavers; job aptitude, rate of career advance, and performance appraisals will be higher for stayers.

Results

All hypotheses were supported by statistically significant margins, supporting the notion that Exxon's better performers were less likely to turn over than their poorer performers. The highest turnover occurred during the fourth year of service. Over the 15 yrs, most leavers (57 pct) had left within 4 yrs of being hired.

46. Keller, R. *The Role of Performance and Absenteeism in the Prediction of Turnover*. *Acad. Manage. J.*, v. 27, No. 1, 1984, pp. 176-183.

Hypothesis

Low performance and high absenteeism are predictive of turnover.

Methods

The sample was 87 hourly clerical, 9 professional, and 25 supervisory employees from a plant manufacturing communications equipment for a major corporation. Average age was 35. Average length of service was 4 yrs. Forty percent were female. Performance was measured by superior ratings on five dimensions. Absenteeism was measured by the frequency of unexcused absences within a 10-month period following the questionnaire administration. Demographic characteristics included age, education, sex,

marital status, number of children, tenure, and job level. The following personality and organizational variables were measured: job satisfaction, group cohesiveness, health locus of control, impatience, competitiveness, and intention to leave. Voluntary turnover was measured for 12 months and found to be 15 pct.

Results

Low performance and high absenteeism were the best predictors of turnover. Other variables significantly related to turnover were job stress, competitiveness, lack of children, and intention to leave. Absenteeism may play the dual role of enabling employees to search for another job and to avoid a stressful job situation.

39. Krackhardt, D., J. McKenna, L. Porter, and R. Steers. *Supervisory Behavior and Employee Turnover: A Field Experiment*. *Acad. Manage. J.*, v. 24, No. 2, 1981, pp. 249-259.

Methods

The sample was 50 branch offices of a bank. 25 pairs were matched by size, location, and average income level of their depositors, then randomly assigned to either the experimental or control group. Supervisors in the experimental group implemented either 0, 1, or 2 interventions. One type of intervention was for the supervisor to meet informally with each teller individually at least once

during a 3-month period. The other intervention consisted of meeting with the tellers as a group at least four times during a 3-month period. The purpose of these meetings was to provide an opportunity for the exchange of questions and information about work group issues and personal needs, and to provide recognition. Turnover was measured for 6 months before the intervention and for 4 months after the interventions began.

Results

All five experimental branches that implemented both interventions experienced almost the same turnover as their matched control branches before the intervention, but experienced less turnover than the control branches after the interventions. However, 6 out of the 13 experimental branches that implemented none or only 1 of the 2 interventions experienced higher turnover than their matched con-

trol branches. Seven of the experimental branches experienced lower turnover than their matched control branches, and two others did not differ from their matched control branches. The experimental branches implementing both objectives held turnover to only 5 pct, while their matched control branches experienced 26 pct turnover. The effects of the interventions on turnover were not altered by controlling for differences in branch efficiencies.

45. McKenna, J.F., P.L. Oritt, and H.K. Wolf. Occupational Stress as a Predictor in the Turnover Decision. *J. Human Stress*, v. 7, No. 4, 1981, pp. 12-17.

Methods

The sample was 175 nurses aides and janitorial and/or housekeeping personnel and other nonprofessionals in a nursing home facility. Turnover had been approximately 65 pct in recent years. A questionnaire measuring intention to leave, age, job satisfaction, job commitment, perceived job stress, and several indicators of the perceived working environment was administered. Actual turnover was not measured.

Results

Only stress and age were significant predictors of turn-

over intention. Respondents with low occupational stress had longer expectations regarding their tenure with the organization. Age was inversely correlated with expected turnover. When stress was used as the dependent variable, it was significantly correlated with commitment, such that individuals with greater commitment to the organization tended to report elevated stress levels. Regarding an individual's position in the hierarchy, it was found that while occupational stress was quite evenly distributed across levels, employees at higher levels in the organization tended to give less consideration to leaving.

86. Mowday, R., C. Koberg, and A. McArthur. The Psychology of the Withdrawal Process: A Cross Validation Test of Mobley's Intermediate Linkages Model of Turnover in Two Samples. *Acad. Manage. J.*, v. 27, No. 1, 1984, pp. 79-94.

Methods

The sample was 267 employees engaged in entry-level patient care positions in three State-run custodial hospitals. Average age was 40. Average length of service was 8 yr. Seventy-five percent were females. Also included were 302 employees engaged in entry-level clerical and administrative positions in four agencies of State and county government in the Midwest. Average age was 35. Average length of service was 5 yr. Eighty-nine percent were female. The researchers measured organizational commitment, withdrawal cognitions, career mobility cognitions, and voluntary turnover (for 1 yr after the questionnaire was administered).

Results

Turnover was 15 pct for the hospital workers and 25 pct for the clerical sample. The best predictor of turnover was the employee's intention to stay in the organization. The influence of organizational commitment on turnover was indirect, through its impact on withdrawal cognitions. Except for commitment to the organization, regression analyses failed to double-cross-validate either within or between samples. The failure to cross-validate between samples may reflect differences in the perceived availability of alternative jobs. The general proposition that job attitudes stimulate withdrawal cognitions, which are directly related to eventual turnover, was supported.

40. Mowday, R., and D. Spencer. The influence of Task and Personality Characteristics on Employee Turnover and Absenteeism Incidents. *Acad. Manage. J.*, v. 24, No. 3, 1981, pp. 634-642.

Hypothesis

Job scope and turnover are negatively related, with the relationship departing from linearity at high levels of job scope. "Scope" includes skill variety, autonomy, task identity, task significance, and feedback.

Methods

The sample was 569 employees in 7 agencies of State and county government. Eighty-one percent were female. Average age was 37. Average length of service was 6.3 yr. The short form of the Job Diagnostic Survey was ad-

ministered, and turnover data was collected for 1 yr following the survey.

Results

R^2 , the proportionate reduction of total variation in the dependent variable associated with a combination of independent variables (also known as the coefficient of determination), was equal to 0.075. Job scope explained the most variance in turnover. Need for achievement and need for autonomy were also both significantly related to turnover, suggesting that job scope can be too high, causing greater turnover.

87. Price, J., and C. Mueller. A Causal Model of Turnover for Nurses. *Acad. Manage. J.*, v. 24, No. 3, 1981, pp. 543-565.

Hypotheses

Successively higher degrees of intent to stay will likely produce lower amounts of turnover. Higher job satisfaction will produce higher intent to stay. Greater opportunity will produce higher turnover. More participation, instrumental communication, integration, pay, distributive justice, and promotional opportunity will produce higher job satisfaction. More general training and kinship responsibility will produce a stronger intent to stay.

Methods

The sample was 764 full-time and 415 part-time nurses from 7 hospitals. Questionnaires were mailed to nurses' homes in August 1976. The status of their employment as of September 1977 was assessed.

88. Stumpf, S., and P.K. Dawley. Predicting Voluntary and Involuntary Turnover Using Absenteeism and Performance Indices. *Acad. Manage. J.*, v. 24, No. 1, 1981, pp. 148-163.

Hypotheses

Unexcused absenteeism will be positively related to voluntary turnover. Turnover will be negatively related to performance indices.

Method

Samples were full-time bank tellers in a large metropolitan area employed during the period 1970-76 ($n = 354$) and an independent group of new tellers employed during the period 1977-78 ($n = 242$). The first sample was used to predict turnover in the second sample. Independent variables were sex, age, education, tenure, absenteeism, performance ratings, teller's daily difference record, and pro-

47. Stumpf, S., and K. Hartman. Individual Exploration to Organizational Commitment or Withdrawal. *Acad. Manage. J.*, v. 27, No. 2, 1984, pp. 308-329.

Hypotheses

Entry—Environmental exploration leads to obtaining and assimilating a greater amount of useful, career relevant information. Obtaining a greater amount of information about job opportunities and organizations is likely to result in expectations regarding the chosen job and organization that are more consistent with what is subsequently experienced. Putting forth effort to obtain a greater amount of information affects subsequent motivation to work in the chosen organization. Realistic expectations at the time of choice lead to a greater degree of person-job congruence.

Socialization—Achieving a greater degree of person-job congruence will result in more perceived influence in designing one's work role, better perceived work performance, more work satisfaction, and greater work motivation. Exerting more job-unit influence will result in greater organizational commitment and more feelings of effective work performance. Motivation to perform leads to higher levels of perceived work performance, which subsequently leads to satisfaction with work.

Results

Nineteen percent voluntary turnover was observed. The zero-order correlations indicate (1) the determinants are largely independent of one another and (2) are not strongly related to turnover. The explained variance for turnover was 18 pct. Intent to stay was the most significant determinant, followed by opportunity and general training. Job satisfaction had no significant net influence on turnover; however, it was an important mediating variable. Apparently, its influence on turnover was through its effect on commitment. It is recommended that future studies use 6 months instead of 12 to test predictive models. However, this requires a high turnover rate to have meaningful results.

motional increases. The dependent variable was employment status.

Results

Voluntary turnover was 27 percent in the first sample and 13 percent in the second. Turnover was lower for females than males; negatively related to age and tenure. Absenteeism was positively, but nonsignificantly correlated with turnover. Turnover was negatively related to difference record, promotional increases, and performance ratings by statistically significant amounts. Forty-four percent of the 1977-78 teller turnover could be predicted correctly based on the model derived from the 1970-76 data.

Commitment—Self perception of work performance is related to later feelings of organizational commitment. Commitment leads to less intention to quit. Work satisfaction negatively influences intention to quit. The "intention to quit leading to turnover" relationship is moderated by labor market and economic conditions. Greater environmental exploration leads to increased turnover.

Method

Sample was 157 college students about to enter the job market. Data were collected 2 to 3 months prior to entry, 2 to 3 months after entry, and 8 to 9 months after entry. Voluntary turnover was 15 people.

Results

Work satisfaction and organizational commitment were significant predictors of intention to quit. Intention to quit significantly predicted environmental exploration, but not turnover. Environmental exploration was strongly related to turnover. All hypotheses were generally supported ex-

cept the intention-to-turnover relationship. This may reflect bad economic conditions. It was concluded that developing

expectations that parallel reality—even if they are not met—may reduce turnover.

38. Terborg, J., and T. Lee. A Predictive Study of Organizational Turnover Rates. *Acad. Manage. J.*, v. 27, No. 4, 1984, pp. 793-810.

Hypotheses

Employees located in areas with high demands for labor will have higher voluntary turnover rate than those in areas with low demands. Turnover rates will vary with organization size, although the exact relationship is not specified. Voluntary turnover rates will be negatively correlated with employee descriptions of organizational supportiveness and perceived opportunities to participate in decisions affecting one's work. Voluntary turnover will be negatively correlated with average age, average length of service with organization, and time in position. Turnover will be positively correlated with average level of education and ability.

Method

Sample was full-time retail sales personnel from 65 stores during 1977 and 1978. Turnover data was collected for 12 months following an attitude survey measuring climate.

Results

Turnover rates did not systematically vary with size of store, or perceived amount of supportiveness or perceived opportunity to participate in decisions affecting one's work. Turnover was positively associated with local labor demand and average level of education and ability; and negatively associated with average age, tenure, and time in present position.

44. Zedeck, S., S. Jackson, and E. Summers. Shift Work Schedules and Their Relationship to Health, Adaptation, Satisfaction, and Turnover Intention. *Acad. Manage. J.*, v. 26, No. 2, 1983, pp. 297-310.

Method

The sample was 732 employees from 66 plants of a western power and gas utility. Ninety-six percent were male, 84 pct were white, 79 pct were married, and 43 pct were between 25 and 34 yr old. Fifty-nine percent had been rotating for 1 to 14 yr, 15 pct had rotated for less than 1 yr, and 26 pct had rotated for more than 14 yr.

A questionnaire was administered which measured the dependent variables: health, satisfaction with current rotation policy, preference for retaining or changing schedule, and intention to stay with the organization; and the independent variables—various health complaints, job satisfaction, satisfaction with family, social activities, etc., perceived work environment, and irascibility.

Results

Turnover intentions were positively correlated with digestion problems, muscle pains, heart problems, enthusiasm, tension, tiredness, and irascibility. They were negatively correlated with intrinsic and extrinsic job satisfaction; satisfaction with opportunities for solitary, social, and family activities; perceived supervisory style; task characteristics; performance-reward system; coworker relations; employee work motivation; equipment; employee competence; decision making; work space; pressure; and responsibility. All correlations were statistically significant.

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